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ABSTRACT

This manual provides vocational instructors in public schools with standardized procedures in the form of a Vocational Education Readiness Test (VERT) for assessing the vocational potential of educable mentally handicapped (EMR) secondary school students. The various stages of VERT's development are traced: (1) visits with vocational trade instructors to determine the manipulative skills they perceive as prerequisites to vocational training; (2) consultations with special education personnel to determine the proper procedure and considerations for assessing manipulative skills of EMRs; (3) review of the VERT tests by a panel of vocational and special education personnel; (4) pilot testing by sixty-four tenth graders, equally divided between EMR and regular students; and (5) administration of the tests to 115 regular and 108 EMR students in grades 10 and 11 to determine group means and standard deviations for each test task (the results of which are furnished for comparative purposes in Appendix C). VERT, which should be administered to the student on two separate occasions to measure manipulative skill growth over a two-year period, contains tests for the areas of auto mechanics, basic wiring, carpentry, home economics (clothing construction), masonry, and plumbing. Each subject module includes an outline of test objectives and needed tools, nine to eighteen tasks with preliminary demonstrations of their performance by the evaluator, and scoring result sheets. General instructions are also provided regarding test site considerations, time factors, and evaluator's observation techniques. (HLG)

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VOCATIONAL EDUCATION READINESS TEST

MANUAL

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This test manual is the major product of a research project entitled *"Development and Testing of Criteria for the Identification and Selection of Mentally Handicapped Students for Vocational Programs."* Support of the project was provided by the Bureau of Occupational and Adult Education, United States Office of Education (Vocational Education), under Grant Number G007604315.

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1978

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FOREWORD

This research project was funded through a Federal Grant (G007604315) to the Research and Curriculum Unit at Misissippi State University from July 1, 1976 through June 30, 1978. The major product of the research project was the development of a Vocational Education Readiness Test (VERT). The VERT was developed to assess students' vocational readiness in the following vocational education service areas: home economics (clothing), building trades (basic wiring, carpentry, masonry and plumbing) and auto mechanics.

Both *"regular"* and mentally handicapped students (EMRs) should be assessed on a one-to-one basis under simulated working conditions while using standard size tools, materials, etc. If indicated, prescriptive exercises (Vocational IEPs) are then written by the evaluator for each student. Each student is then tested a second time and his/her performance scores on the test can be used as a basis for predicting vocational success. Performance on the VERT, along with additional evaluative criteria, etc., may serve the evaluator in decision making, i.e., whether to select or reject a student for a specific vocational program.

Benefits to be realized from the VERT include:

* Assist local school districts in complying with P.L. 94-142;
* Select only those EMR and *"regular"* students with the most potential for success in regular vocational programs;
* Use test results as criteria for prevocational curriculum development (IEPs);
* Use test results for planning future vocational programs; and
* Provide parents, school officials, etc. with hard data as to why a student may or may not be ready for a specific vocational program.

The project staff is indebted to the project's steering committee. (See Appendix A.) In addition, the project staff is grateful for the assistance provided by the Vocational-Technical Education, Vocational Rehabilitation, and Special Education Divisions of the State Department of Education. Others contributing to the completion of this research project were the Methodist Hospital in Jackson, Mississippi; Mississippi State University; and the State Hospital for Handicapped Children in Ellisville, Mississippi. Appreciation is also extended to the Ackerman, Canton, Clarksdale, Forrest County, Greenwood, Jackson, Louisville, Macon, Starkville, and Sturgis school districts for their cooperation. In addition, Mr. Hal Jenkins and Mr. Roger Pitt, Graduate Research Assistants, are to be commended for their significant contributions with regard to the development of the VERT.

Edward L. Thomas
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TABLE OF CONTENTS

PAGE

Foreword iii

List of Tables vi

List of Figures vii

Chapter 1: ***Introduction*** 1

Test Development 1

Review of Test 2

Pilot Testing 2

Summary Statistics 2

Chapter 2: ***Test Construction, Administration, and Scoring*** 3

Test Site Consideration 3

Time Consideration 3

Evaluator Instructions 5

Chapter 3: ***The VERT*** 7

Auto Mechanics 9

Basic Wiring 27

Carpentry 43

Home Economics (Clothing) 65

Masonry 77

Plumbing 91

APPENDICES

Appendix A (Project Steering Committee) 107

Appendix B (Illustrations) 111

Appendix C (Tables) 129

LIST OF TABLES

PAGE

Table 1: Measurement Skills of Regular Students in Auto Mechanics 129

Table 2: Measurement Skills of Handicapped Students in Auto Mechanics 129

Table 3: Task Completion Time (Seconds) for Regular and Handicapped Students in Auto Mechanics 130

Table 4: Measurement Skills of Regular Students in Basic Wiring 131

Table 5: Measurement Skills of Handicapped Students in Basic Wiring 131

Table 6: Task Completion Time (Seconds) for Regular and Handicapped Students in Basic Wiring 132

Table 7: Measurement Skills of Regular Students in Carpentry 133

Table 8. Measurement Skills of Handicapped Students in Carpentry 133

Table 9: Task Completion Time (Seconds) for Regular and Handicapped Students in Carpentry 134

Table 10: Measurement Skills of Regular Students in Clothing 135

Table 11: Measurement Skills of Handicapped Students in Clothing 135

Table 12: Task Completion Time (Seconds) for Regular and Handicapped Students in Clothing 136

Table 13: Measurement Skills of Regular Students in Masonry 137

Table 14: Measurement Skills of Handicapped Students in Masonry 137

Table 15: Task Completion Time (Seconds) for Regular and Handicapped Students in Masonry 138

Table 16: Measurement Skills of Regular Students in Plumbing 139

Table 17: Measurement Skills of Handicapped Students in Plumbing 139

Table 18: Task Completion Time (Seconds) for Regular and Handicapped Students in Plumbing 140

LIST OF FIGURES

PAGE

Figure 1: Flowchart for EMRs 4

I.

INTRODUCTION

The Vocational Education Readiness Test (VERT) was developed in 1976-78 to provide prevocational instructors in the public schools with standardized procedures for assessing the vocational potential of secondary EMRs. The tests were also designed to assist local personnel in prescribing corrective exercises for students who appear to have problems with tool utilization and other tasks. In addition, the tests may prove to be beneficial for use in selecting *"regular"* students for specific vocational programs and for counseling purposes.

The VERT was not developed as a replacement for the numerous commercially-developed work samples, i.e., the JEVS, TALENT, VIEWS, HESTER, McCARRON-DIAL, etc. The above tests were designed to be administered to handicapped adults to indicate which job categories listed in the **Directory of Occupational Titles** for which an individual is best suited. These work samples appear to do a superb job and are widely distributed and used by Vocational Rehabilitation and other social agencies. Additionally, these work samples were not designed to aid prevocational instructors and/or special education personnel in determining whether or not an EMR has the potential for vocational success in one or more of the regular secondary vocational education trade areas.

Test Development

Initially, after project funding a **Project Steering Committee** was formed to assist the staff in planning for the project. (See Appendix A.) The committee was composed of individuals from Goodwill Industries, public schools, State Department of Education (Vocational Rehabilitation, Special Education, Vocational-Technical Education) and the Research and Curriculum Unit at Mississippi State University. Subsequent to the initial meeting, the committee met every three to four months to review the progress being made by project staff members.

Utilizing recommendations made by the project steering committee, the research staff sought answers to the following questions:

1. What manipulative skills were needed by EMRs as *"prerequisites"* to facilitate entrance into the various vocational programs;
2. How can we identify and measure these manipulative skills;
3. What criteria will be used to determine minimum acceptable levels of manipulative skills; and
4. When should a vocational education readiness test be administered?

The most common types of vocational programs in the State of Mississippi were determined in order to provide the basis for future test development. Staff members then visited with vocational trade instructors in randomly selected programs to determine those manipulative skills perceived by instructors to be important prior to entrance into a program. An effort was then made to correlate the identified prerequisite skills with curriculum guides (content) for each area. In addition, suggestions and comments were recorded concerning body positioning, hand and arm strength, and eye/hand coordination as it relates to specific vocational skills. Special education personnel were also consulted to determine and identify proper procedure and considerations when attempting to assess manipulative skills of the EMR.

Review of Test

Upon developing an interim draft of the tests for each trade area the tests were submitted to six panels of experts - one for each area - consisting of teacher educators in special education, prevocational personnel, vocational trade area instructors and special education personnel from local schools. Panel members having had an opportunity to review the tests on an individual basis, met as a group at Mississippi State University for review purposes. Each panel member for each area was selected for his/her expertise in a particular trade area. The panels of experts were asked to review the tests for clarity, design and format, and use with both EMR and *"regular"* students. All appropriate recommendations provided by the panels of experts were incorporated.

Pilot Testing

A total of 64 students were selected from six different school systems to serve in the pilot study for the VERT. Thirty-two students were EMRs and 32 students were regular students (I.Q. 90+) enrolled in the 10th grade. Several of the EMRs had received limited industrial arts training; however, none of the regular students had completed an industrial arts course. The project staff utilized the pilot study to facilitate the establishment of a standardized testing procedure for all tasks in the VERT. In addition, efforts were made to print all testing procedures in detail to ensure that scores obtained by one trained evaluator would likewise be obtained by other evaluators.

Summary Statistics

The establishment of criterion-levels (time completion) for each task in each module was the final endeavor in the development of the VERT. The word criterion, as used in this manual, refers to a domain of manipulative skills. Each examinee was tested against a well-defined domain of manipulative behaviors (module objectives). VERT objectives were then organized into non-overlapping tasks with regard to each domain of behavior.

The initial standardization group was comprised of *"regular"* 10th-grade students. In addition, 10th and 11th grade EMR students were tested. No students were tested outside Mississippi due to time and monetary limitations. However, to ensure as much representativeness as possible for this group, students were tested from all areas of the State of Mississippi to include urban, suburban, and rural school systems. *"Regular"* students (N=115) were systematically drawn from 10th grade class rolls and cluster sampling techniques were employed in the selected school districts to determine EMR student examinees (N=108).

II.

ADMINISTRATION AND SCORING

Research and Curriculum Unit personnel will provide a three-day (24 hr.) training period on an annual basis for local school personnel who wish to receive training in administering the VERT. The training will be offered on a *"no cost"* basis by the R/CU; however, local school systems will provide for transportation, food, and lodging for their participants.

A copy of the **User's Manual** which contains the tests, initial standardization data, test construction data, etc. will be available for each person completing the 24 hours of training. Each trained evaluator will construct the VERT by referring to specifications in Appendix B and to tool and material lists printed for each of the six tests. Construction costs of the VERT are estimated to be $400.00.

Testing Site Considerations

The evaluator should carefully read and study a testing module in conjunction with the scoring results sheet **prior to** testing a student. Each module contains objectives, tools and equipment needed, preliminary exercises, special instructions, and student performance objectives. The evaluator must observe and follow instructions in order to maintain consistency in testing and to assist in the establishment of item validity.

To administer a testing module of the VERT, the following conditions should exist:

1. Room, well lighted and free from outside disturbances;
2. Work table(s) approximately 30" x 30" x 60";
3. Protective covers for table tops; and
4. At least one hour of uninterrupted time.

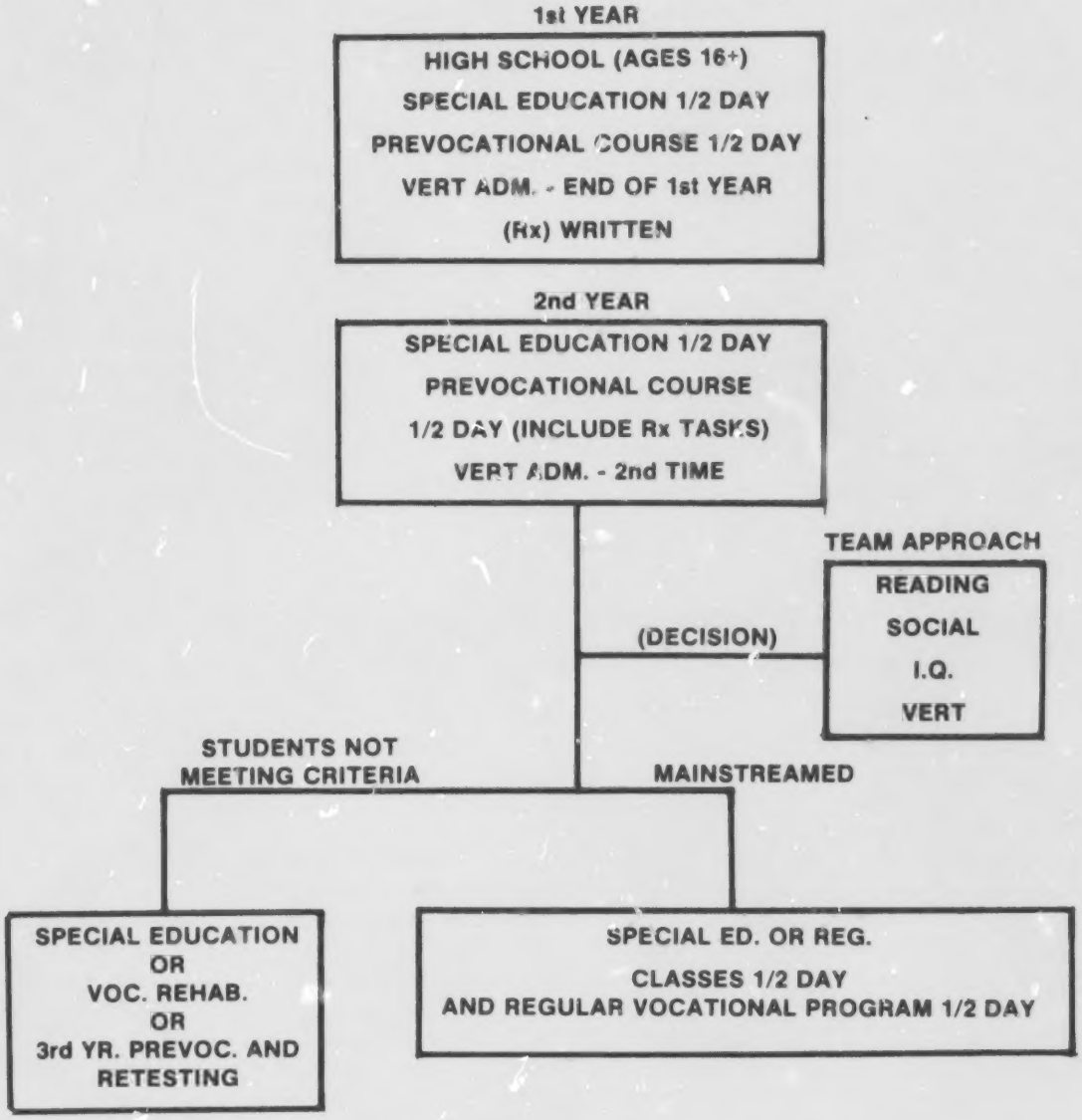
Time Considerations

Selecting an appropriate time for administering the VERT involved a detailed study of prevocational program offerings for EMRs in Mississippi. Generally, students identified as EMRs by a Regional Screening Team attend special education classes for one-half day and prevocational programs for one-half day. Several instances were noted where EMRs were mainstreamed into regular academic classes; however, few EMRs were observed in the regular vocational programs. Instead, EMRs usually worked for private enterprise, etc. on a part-time basis. Upon completion of two years of prevocational education and special education at the secondary level, EMRs were placed directly into jobs or were referred to sheltered workshops operated by vocational rehabilitation and other social agencies.

The VERT was developed as an instrument which would be administered to the same student on two different occasions. (See Figure 1.) The first test determines a student's vocational potential as it spotlights specific strengths and weaknesses of the student. Prescriptive exercises are written for the first test only. Such exercises may necessarily continue for one full school year or may be somewhat shorter, depending upon the student's progress. At the end of the second year of prevocational work, the student is tested a second time. Scores on the first test are compared with scores on the second test and the student's manipulative skill growth is considered.

FIGURE 1

SELECTION OF EMRs FOR REGULAR VOCATIONAL PROGRAMS



The VERT was not intended for use in isolation of other instruments, data, etc. Information such as student's reading level, I.Q. and social skills should be available to a screening team prior to deciding whether or not a student has potential for success in a regular vocational course. Using this approach, EMRs selected for mainstreaming into the regular vocational programs should be able to perform most manipulative skill tasks with a minimum of adjustments. Those students not selected should receive counseling and be referred to social agencies which provide services for adults.

Evaluator Instructions

The evaluator, while performing the preliminary task, should ask the student to stand to his/her left side. Upon completion of the preliminary task, the evaluator should place all tools, etc. on a 24" x 24" starting mat which should be mounted on top of the work bench. At this point, the evaluator should discuss the task with the student; however, should not permit the student to practice using the tools. The student, while standing within 24" of the tools and having been informed to work as fast as he/she can, is then given the command to start the task. At this command, the evaluator also starts the stopwatch. The evaluator should closely observe the student and record in the comment section of the score sheet any manipulative problems which may warrant correction. Such problems generally involve the student's inability to hold certain objects, a tendency to reverse the directionality of tools, or simply problems which occurred when a student fails to follow the evaluator's oral directions which were given in the preliminary task.

Upon completion of the assigned and timed task the student is not required to replace the tools on the starting mat as a signal for the evaluator to stop the watch. Instead, the evaluator stops the watch immediately when he/she observes that the task has been completed. For example, in the carpentry test, the student is instructed to drive four nails (8d) into the premarked wood. The evaluator places the hammer and nails on the starting pad, gives the command to start, and starts the watch. When the student has driven the last nail, the evaluator stops the watch. The evaluator does not wait until the student places the hammer back on the starting mat. The evaluator records student's time on the score sheet in seconds for each task. An N/C is placed in the time slot for each task which the student fails to complete.

The project staff found it desirable to stop the watch on a student who consumed twice as much time on a task as normally required. For example, if the mean time for a task is 125 seconds, when a student consumes 250 seconds and has not completed the task the evaluator stops the clock, inserts N/C in the time slot and writes the problem in the comments section. A prescription for corrective exercises would be written for this task. Students taking tests which involve body positioning (auto mechanics, masonry) are permitted to assume the correct body position prior to being given the command to start.

In determining what is an acceptable or unacceptable performance level, it was found that a solution could not be obtained simply by utilizing the top 15 - 20% of the EMRs who successfully completed the tasks in the shortest period of time. Therefore, for comparative purposes, 115 regular 10th grade students were randomly selected from 10 school districts in Mississippi. The enclosed score sheets reflect group means and standard deviations for both EMRs and regular students for each task contained in each test. (See Appendix C.)

III.
THE VERT

AUTO MECHANICS

AUTO MECHANICS

Objective(s):

1. To determine student's ability to measure in inches, half-inches, quarter-inches and eighth-inches.
2. To determine student's ability to sort hexagonal nuts of differing size with the left hand and with the fingers of the left hand screw them on bolts grouped by size.
3. To determine student's ability to sort hexagonal nuts of differing size with the right hand and with the fingers of the right hand screw them on bolts randomly arranged.
4. To determine student's ability to match the proper wrench to hexagonal bolts of different sizes.
5. To determine student's ability to use a 1/2" open-end wrench and a 1/2" socket with ratchet while lying on the right shoulder.
6. To determine student's ability to use a 7/16" box-end wrench and 7/16" socket with ratchet while lying on the left shoulder.
7. To determine student's ability to use a 9/16" open-end wrench and a 9/16" socket with ratchet while in the supine position.
8. To determine student's ability to use a 9/16" socket and ratchet with extension and a 9/16" box-end wrench while in the standing position.
9. To determine student's ability to remove and replace an automotive component by hand.
10. To determine student's ability to use a torque wrench.
11. To determine the student's ability to use both flatblade and Phillips screwdrivers.

Tools and Equipment Needed:

One size discrimination and finger dexterity kit which includes:

Six ½" x 2½" hexagonal bolts

Twelve 3/8" x 2½" hexagonal bolts

Four 5/16" x 1½" hexagonal bolts

Twelve 5/16" x 2½" hexagonal bolts

Twelve ¼" x 2½" hexagonal bolts

One auto mechanics mock-up which includes:

One 7/16" combination (open-end/box-end) wrench

One 1/2" combination (open-end/box-end) wrench

One 9/16" combination (open-end/box-end) wrench

One 1/2" drive socket set including:

Sockets	Fittings
One 7/16"	One reversible ratchet
One 1/2"	One extension
One 9/16"	

One flat blade 1/4" screwdriver

One Phillips 1/4" screwdriver

One 1/2" drive direct reading scale torque wrench

Two slotted roundhead stove bolts 1/4" - 2"

Two Phillips head stove bolts 1/4" - 1 1/4"

12" plastic ruler

Preliminary Exercise:

The evaluator will identify a 12" plastic rule and demonstrate how to measure to the nearest inch, half-inch, quarter-inch, and eighth-inch. Answer any questions at this time; however, avoid *"teaching"* the student to measure by giving repeated demonstrations. (See Figure 1.)

Special Instructions: Lines for Tasks 1 - 4 should measure 3", 3½", 3¼", and 3⅛", respectively, and should be drawn on a separate sheet of paper.

Figure 1.

Task 1: _____*

Task 2: _____*

Task 3: _____*

Task 4: _____*

Tasks 1 through 4

Given a 12" plastic rule and measuring tasks 1, 2, 3, and 4, the student will measure the line in each task and tell his/her findings to the evaluator.

*Lines are drawn on separate sheet to respective length by evaluator.

Preliminary Exercise:

The evaluator will demonstrate, with the left hand, how to sort the nuts in section 1 of the kit and screw the nuts on the bolts. (See Figure 2.)

Special Instructions. *Prior to beginning task #5, place all nuts flat in the bin of section 1 of the kit.*

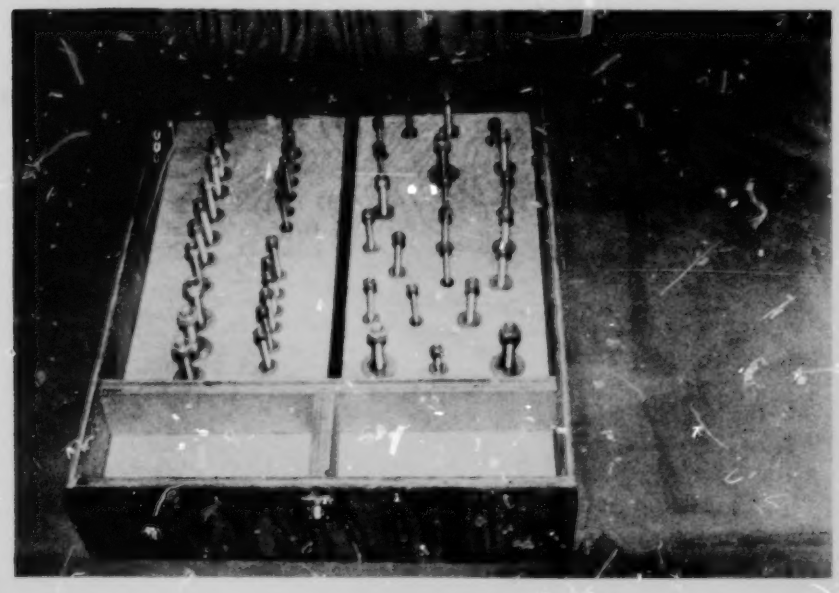


Figure 2.

Task 5

Given the size discrimination and finger dexterity kit, the student will select nuts by size from the largest to the smallest and with left hand screw them on the bolts in section 2 until they are even with the top. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate, with the right hand, how to sort the nuts in section 2 of the kit and screw the nuts on the bolts. (See Figure 3.)

Special Instructions: *Prior to beginning task #6, place all nuts flat in the bin of section 2 of the kit.*

Figure 3.

Task 6

Given the size discrimination and finger dexterity kit, the student will select nuts by size from the largest to the smallest and with the right hand screw them on the bolts in section 2 until they are even with the top. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to match one wrench with its matching bolt. Once the two have been matched, they will be placed away from the remainder of the bolts and wrenches. (See Figure 4.)

Special Instructions: *The four bolts will be placed on the table in order from smallest to largest (left to right). The four wrenches will be in a randomly arranged group.*

Figure 4.

Task 7

Given four combination wrenches and four hexagonal bolts, the student will select the proper wrench for each bolt from largest to smallest. **Note time!**

Preliminary Exercise:

The evaluator will identify the 1/2" open-end wrench, and the 1/2" socket, and ratchet to be used. The evaluator will then demonstrate how to remove and replace the water pump. (See Figure 5.)

Special Instructions: *The evaluator will demonstrate how to reverse the ratchet but leave it set for student to begin the task. Instruct student to tighten the bolts only to the degree that they cannot be loosened with the fingers. Instruct student to completely remove the water pump from the mock-up, place it on the floor with all bolts removed, and then replace it. Have student attach socket and extension as part of this task. In addition, the evaluator should demonstrate the correct body position to be used for removal of the water pump.*

Figure 5.

Task 8

Given the auto mechanics mock-up, the student will remove and replace the water pump using the 1/2" open-end wrench in the left hand and the 1/2" socket with ratchet with extension in the right hand while lying on the right shoulder. **Note time!**

Preliminary Exercise:

The evaluator will identify the 7/16" box-end wrench, and the 7/16" socket and ratchet to be used. The evaluator will then demonstrate the proper body position and instruct the student to mount the blower motor to the mock-up just as shown in the picture. (See Figure 6.)

Special Instructions: The evaluator should demonstrate the correct body position to be used for mounting the blower motor. Student may use picture attached to the side of the mock-up as a guide.

Figure 6.

Task 9

Given the auto mechanics mock-up, the student will mount the blower motor using the 7/16" box-end wrench and 7/16" socket and ratchet while lying on the left shoulder. **Note time!**

Preliminary Exercise:

The evaluator will identify the 9/16" open-end wrench and the 9/16" socket and ratchet to be used. The evaluator will then demonstrate how to remove and replace the brake master cylinder. (See Figure 7.)

Figure 7

Task 10

Given the auto mechanics mock-up, the student will remove and replace the brake master cylinder using the 9/16" open-end wrench on the top and the 9/16" socket with ratchet on the bottom while in the supine position. **Note time!**

Preliminary Exercise:

The evaluator will identify the 9/16" box-end wrench, the 9/16" socket and ratchet and extension, and demonstrate how to assemble the extension, socket, and ratchet. The evaluator will then demonstrate how to remove and replace the fuel pump. (See Figure 8.)

Special Instructions: Instruct the student to begin with fingers when replacing the nuts.

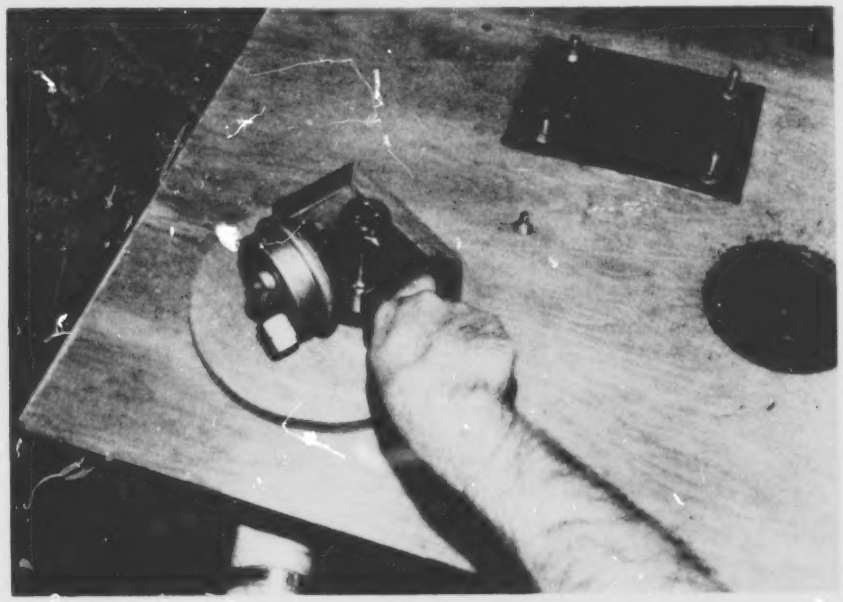


Figure 8.

Task 11

Given the auto mechanics mock-up, the student will remove and replace the fuel pump using the 9/16" socket, ratchet, and extension on the top and the 9/16" box-end wrench on the bottom while in the standing position. **Note time!**

24

Preliminary Exercise:

The evaluator will demonstrate how to remove and replace the carburetor by using only the hands and fingers. (See Figure 9.)

Special Instructions: Inform the student that different lengths of bolts are used in order to facilitate replacement of the carburetor.

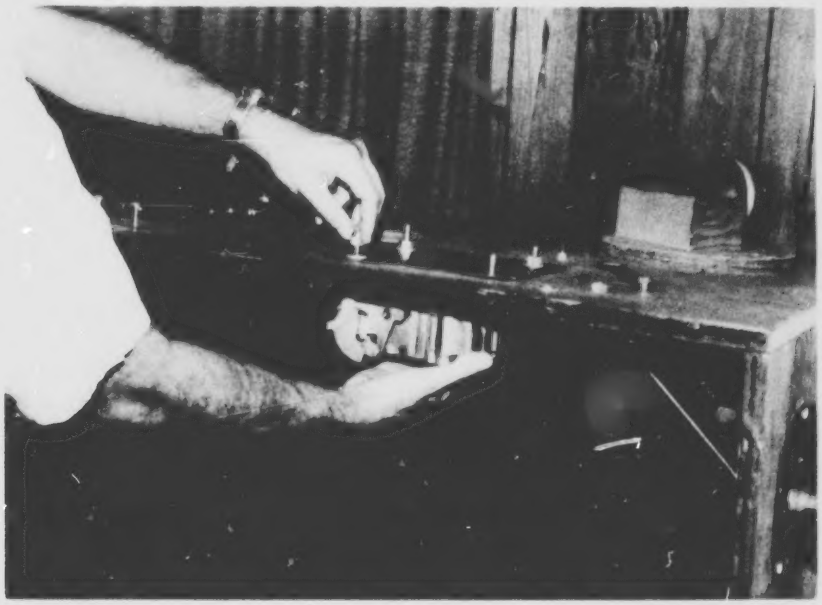


Figure 9.

Task 12

Given the auto mechanics mock-up, the student will remove and replace the carburetor using only the hands and fingers while kneeling on one knee. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to properly torque one nut of the carburetor to 10′ pounds. (See Figure 10.)

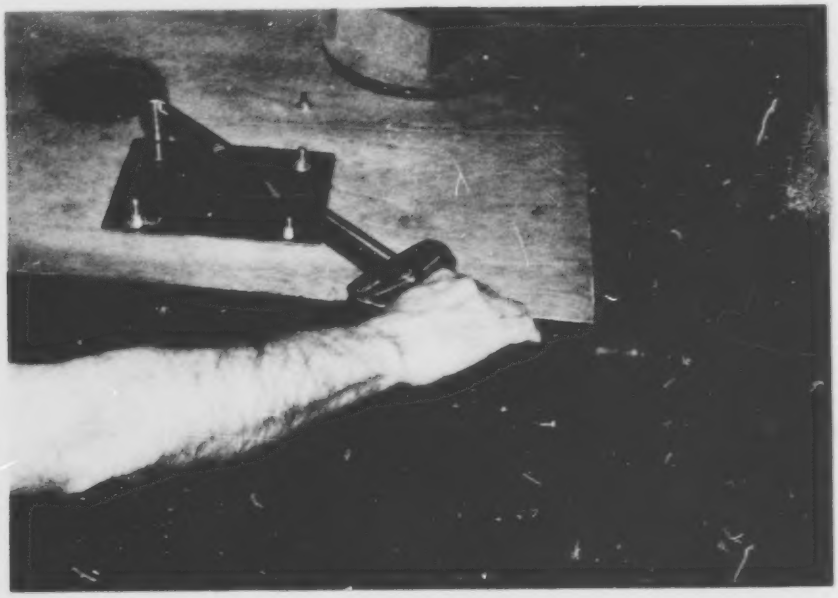


Figure 10.

Task 13

Given the auto mechanics mock-up, the student will torque the four nuts of the carburetor to 10′ pounds with a tolerance of + or - 5′ pounds. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to screw both types of stove bolts into the mock-up. (See Figure 11.)

Figure 11.

Task 14

Given the auto mechanics mock-up, stove bolts, flatblade and Phillips screwdrivers, the student will screw the bolts into the mock-up until the head of the bolts are touching the nuts. **Note time!**

VOCATIONAL EDUCATION REALINESS TEST (VERT)
SCORING RESULTS SHEET

NAME: _____

AUTO MECHANICS TEST

Measurement Skills (for tasks 1 - 4, check (✓) the appropriate column)

	Response*		Handicapped Response**		Regular Response **	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Task 1 (Inch)	_____	_____	8	7	15	0
Task 2 (Half-Inch)	_____	_____	6	9	15	0
Task 3 (Quarter-Inch)	_____	_____	4	11	14	1
Task 4 (Eighth-Inch)	_____	_____	5	10	11	4

Student Performance Data (beginning with task 5, record the completion time in seconds)

	TIME*	MEAN HANDICAPPED TIME**	MEAN REGULAR TIME**
Task 5	_____	245	200
Task 6	_____	173	156
Task 7	_____	31	18
Task 8	_____	1446	1063
Task 9	_____	397	391
Task 10	_____	387	381
Task 11	_____	381	359
Task 12	_____	179	148
Task 13	_____	320	281
Task 14	_____	234	206

* Write N/C should the student be unable to complete the task.

** These comparative scores were taken from statistical tables in this **User's Manual.**

COMMENTS: _____

_____

_____

_____

_____

Rx: _____

_____

_____

_____

_____

_____

_____

_____

_____

29

BASIC WIRING

BASIC WIRING

Objective(s):

1. To determine student's ability to measure in inches, half-inches, quarter-inches and eighth-inches.
2. To determine student's ability to use a crimper/stripper tool as a wire cutter.
3. To determine student's ability to use a crimper/stripper tool as a bolt cutter.
4. To determine student's ability to use a crimper/stripper tool as a wire stripper.
5. To determine student's ability to make a pigtail splice with #12/2 insulated wire using a lineman's pliers.
6. To determine student's ability to insulate wires using PVC electrical tape.
7. To determine student's ability to splice wires using insulated plastic solderless connectors.
8. To determine student's ability to connect #6 single cables with solderless type B connectors.
9. To determine student's ability to wire a single pole wall switch.
10. To determine student's ability to wire a ceiling fixture.
11. To determine student's ability to wire a wall receptacle.

Tools Needed:

One Crimper/stripper tool

Four lengths of #12/2 cable (approx. 12")

One roll PVC electrical tape

Lineman's pliers

One machine bolt (10/24) (approx. 2")

One straight blade screwdriver (¼")

Slip joint pliers

Two insulated plastic solderless connectors on power feed apparatus

Two type "B" solderless connectors

Two lengths of #6 insulated cable

One ceiling outlet (box), attached to mock-up

Two standard wall outlet boxes w/covers, attached to mock-up

One porcelain base ceiling fixture

One single pole wall switch

One duplex wall receptacle

Threes lengths of #12/2 cable (for electrical mock-up box)

One needlenose pliers

One diagonal cutting pliers

One straight blade 3/16" screwdriver

One power feed apparatus (part of kit)

12" plastic ruler

Preliminary Exercise:

The evaluator will identify a 12" plastic rule and demonstrate how to measure to the nearest inch, half-inch, quarter-inch, and eighth-inch. Answer any questions at this time; however, avoid *"teaching"* the student to measure by giving repeated demonstrations. (See Figure 1.)

Special Instructions: Lines for Tasks 1 - 4 should measure 3", 3½", 3¼", and 3⅛", respectively, and should be drawn on a separate sheet of paper.

Figure 1.

Task 1: _____*

Task 2: _____*

Task 3: _____*

Task 4: _____*

Tasks 1 through 4

Given a 12" plastic rule and measuring tasks 1, 2, 3, and 4, the student will measure the line in each task and tell his/her findings to the evaluator.

*Lines are drawn on separate sheet to respective length by evaluator.

Preliminary Exercise:

The evaluator will identify the crimper/stripper tool and demonstrate its use as a cable cutter. (See Figure 2.)

Special Instructions: Wear safety glasses!

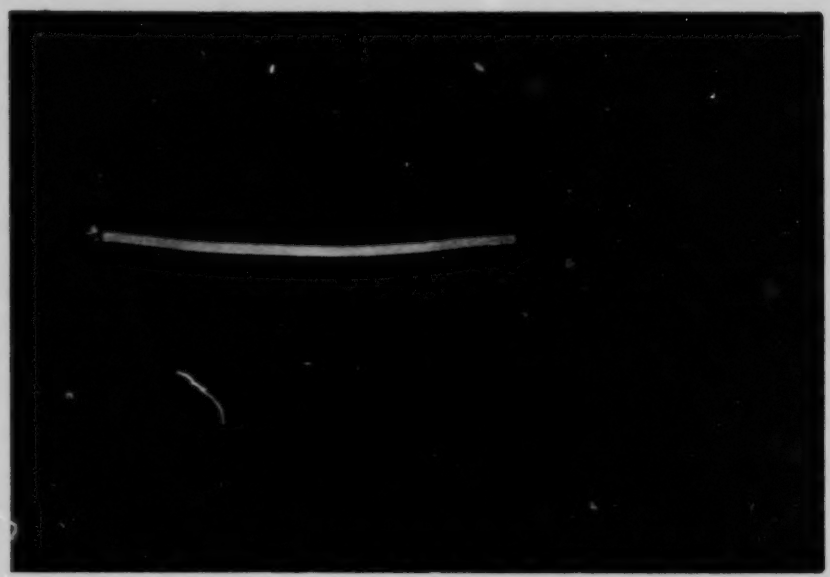


Figure 2.

Task 5

Given a crimper/stripper tool and one length of #12/2 cable approximately 12" long, the student will cut off approximately 1" of cable. **Note time!**

Preliminary Exercise:

The evaluator will identify the crimper/stripper tool and demonstrate its use as a bolt cutter. (See Figure 3.)

Special Instructions: *Caution student concerning Task 6. If crimper/stripper tool is held incorrectly a student's finger or fingers could be severely cut. Wear safety glasses!*

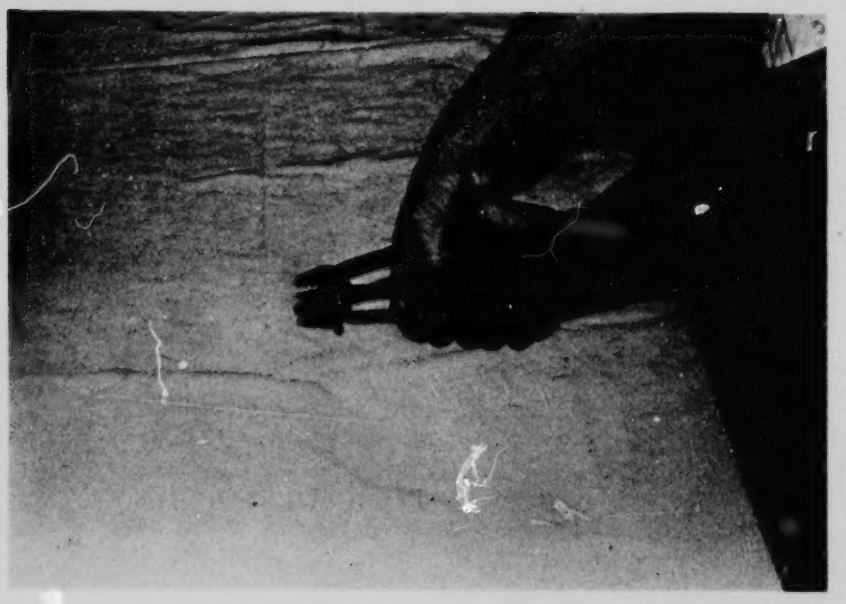


Figure 3.

Task 6

Given a crimper/stripper tool, screwdriver, and one machine bolt (10/24), the student will screw the bolt into the proper size threaded hole on the cutters as indicated to a distance of approximately ¼" and using both hands will cut the bolt. **Note time!**

Preliminary Exercise:

The evaluator will identify the crimper/stripper tool and demonstrate its use as a wire stripper. (See Figure 4.)

Special Instructions: Wear safety glasses!

Figure 4.

Task 7

Given a crimper/stripper tool and two lengths of #12/2 cable with the outer cable insulation removed for 3", the student will cut and strip approximately 1½" of insulation from the black wire and 1½" from the white wire. **Note time!**

Preliminary Exercise:

The evaluator will identify two lengths of #12/2 cable and linesman's pliers and demonstrate how to make a pigtail splice. (See Figure 5.)

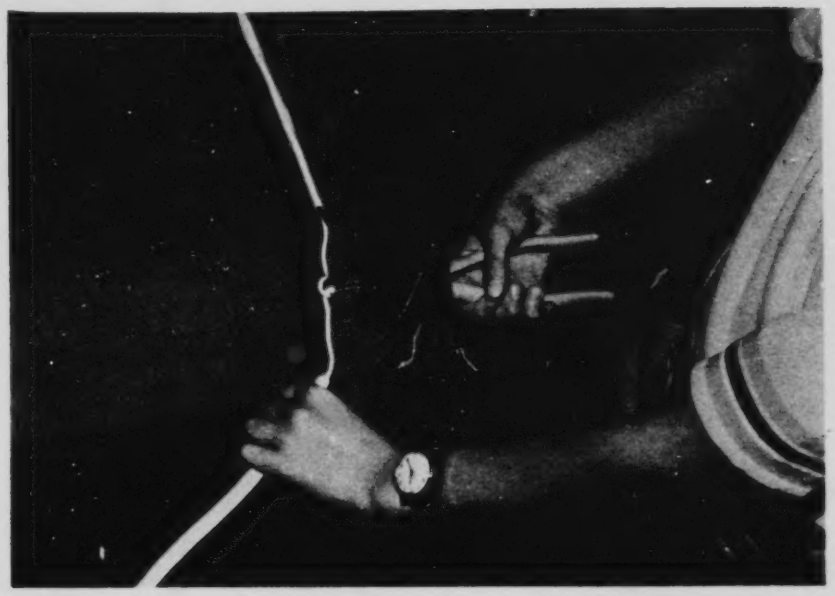


Figure 5.

Task 8

Given two lengths of #12/2 cable (used in task #7) and lineman's pliers, the student will splice (pigtail) black wire to black wire and white wire to white wire, insuring that the spliced ends are cut smooth to the same length. **Note time!**

Preliminary Exercise:

The evaluator will identify a roll of PVC electrical tape and demonstrate how to insulate spliced wires. (See Figure 6.)

Figure 6.

Task 9

Given the spliced cable used in task #8 and a roll of PVC electrical tape, the student will tape the two splices. **Note time!**

Preliminary Exercise:

The evaluator will identify two insulated plastic solderless connectors and demonstrate how to connect wires using the connectors. (See Figure 7.)

Figure 7.

Task 10

Given the spliced wires used in task #9, the student will remove the tape and will screw (by hand) two insulated plastic solderless connectors over the splices. **Note time!**

Preliminary Exercise:

The evaluator will identify two #6 insulated cables, one type-B solderless (noninsulated) connector, power feed apparatus, and slip joint pliers, and will demonstrate how to connect power feed lines using the type-B solderless connector. (See Figure 8.)

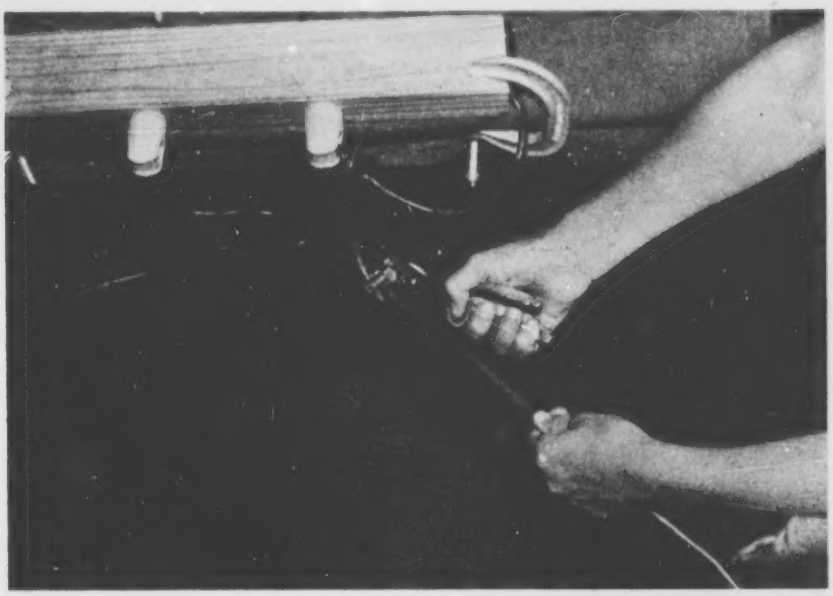


Figure 8.

Task 11

Given two #6 insulated cables, one type-B solderless connector, slip joint pliers, and power feed apparatus, the student will tie the cable to the insulator and join the two cables with type-B connector. **Note time!**

Preliminary Exercise:

The evaluator will identify a single pole wall switch and outlet box and will demonstrate how to wire the wall switch. (See Figure 9.)

Special Instructions: Wires must be cut and stripped for each student. Instruct the student to use the 1/4" screwdriver on cover and 3/16" screwdriver for terminal screws and screws attaching wall switch to outlet box.

Figure 9

Task 12

Given a wall switch, cover, outlet box, #12/2 cable, 3/16" and 1/4" straight blade screwdrivers and needlenose pliers, the student will bend the black and white wires and attach them to the terminal screws on the wall switch, attach the wall switch to the outlet box, and place cover on the box. **Note time!**

Preliminary Exercise:

The evaluator will identify a porcelain ceiling fixture and square outlet box and will demonstrate how to wire the fixture. (See Figure 10.)

Special Instructions: Wires must be cut and stripped for each student. Use 1/4" screwdriver.

Figure 10.

Task 13

Given a porcelain ceiling fixture, square outlet box, #12/2 cable, needlenose pliers, and 1/4" common screwdriver, the student will attach the black wire to the dark terminal screw and the white to the light terminal screw and attach the fixture to the ceiling outlet box. **Note time!**

Preliminary Exercise:

The evaluator will identify a duplex wall receptacle cover, and outlet box and will demonstrate how to attach the wires to the quick-wire receptacle. (See Figure 11.)

Special Instructions: Use a standard 3/16" screwdriver for cover and a standard 1/4" screwdriver for attaching receptacle to outlet box.

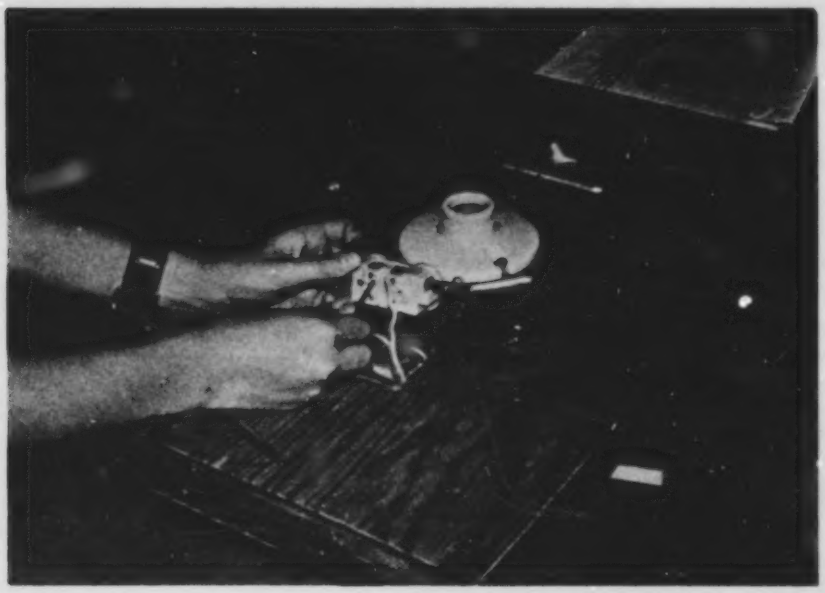


Figure 11.

Task 14

Given a duplex wall receptacle, cover, outlet box, #12/2 cable, and a 3/16" and ¼" screwdriver, the student will insert the white wire to the white wire opening on the quick-wire wall receptacle, the black wire to the other quick-wire opening, attach receptacle to the outlet box, and attach cover. **Note time!**

VOCATIONAL EDUCATION READINESS TEST (VERT)
SCORING RESULTS SHEET

NAME: _____

BASIC WIRING TEST

Measurement Skills (for tasks 1 - 4, check (✓) the appropriate column)

	Response*		Handicapped Response**		Regular Response **	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Task 1 (Inch)	_____	_____	15	10	24	1
Task 2 (Half-Inch)	_____	_____	5	20	24	1
Task 3 (Quarter-Inch)	_____	_____	2	23	24	1
Task 4 (Eighth-Inch)	_____	_____	2	23	23	2

Student Performance Data (beginning with task 5, record the completion time in seconds)

	TIME*	MEAN HANDICAPPED TIME**	MEAN REGULAR TIME**
Task 5	_____	57	11
Task 6	_____	220	184
Task 7	_____	90	36
Task 8	_____	182	142
Task 9	_____	120	96
Task 10	_____	194	180
Task 11	_____	141	67
Task 12	_____	378	287
Task 13	_____	314	205
Task 14	_____	219	162

* Write N/C should the student be unable to complete the task.

** These comparative scores were taken from statistical tables in this **User's Manual.**

COMMENTS: _____

_____

_____

_____

_____

Rx: _____

_____

_____

_____

_____

_____

_____

_____

_____

CARPENTRY

Objective(s):

1. To determine student's ability to measure in inches, half-inches, quarter-inches, and eighth-inches.
2. To determine student's ability to use a 12" carpenter square.
3. To determine student's ability to use adjustable "C" clamps.
4. To determine student's ability to use a combination square.
5. To determine student's ability to use a handsaw.
6. To determine student's ability to use a handsaw and miter box.
7. To determine student's ability to use a ratchet brace with a ¼" bit.
8. To determine student's ability to screw lag bolts through drilled holes.
9. To determine student's ability to bolt two pieces of material together using lag bolts.
10. To determine student's ability to use a ratchet screwdriver/drill to drill pilot holes for wood screws.
11. To determine student's ability to use a hand drill in combination with ½" countersink.
12. To determine student's ability to use a common screwdriver to drive 1" wood screws into pilot holes and remove them.
13. To determine student's ability to use a claw hammer to drive common nails.
14. To determine student's ability to use a claw hammer to remove common nails.
15. To determine student's ability to use a torpedo level to level and plumb.
16. To determine student's ability to use a coping saw to cut angles which are not 90° in wood.

Tools Needed:

12" carpenter square

Combination square

8½" x 14" white paper

#2 lead pencil

One piece of (2" x 4" x 24") wood with paper taped across both ends of material (included in kit).

One 26" handsaw

Three adjustable "C" clamps (3" size)

Miter box (Birch, Maple, etc.)

2" x 4" scrap wood stock (30" long) or longer

1" x 4" scrap wood stock (12" long) or longer

12" plastic rule

- Two 2" x 2" pieces of plywood for use with adjustable "C" clamps

Pattern for holes (One with four holes for lag bolt task and one with seven holes for countersink, etc. task)

Ratchet brace (locked ratchet)

¼" Auger bit (purchase 3 spares)

Adjustable wrench 8"

Three 3" lag bolts (5/16" diameter)

Two 2" x 4" x 30" wood stocks pre-drilled for lag bolts

Ratchet screwdriver/drill (9/64" drill point — purchase 3-4 spares)

Hand drill

Common screwdriver (with ¼" blade)

½" countersink

Box of 100 1" #8 flathead screws (purchase 1 spare box)

Claw hammer

8d common nails (purchase several lbs.)

8" Torpedo level

Level/Plumb appartus

Coping saw with extra blades

Polygon (made from ¼" plywood)

Safety glasses - (to be worn where appropriate)

Preliminary Exercise:

The evaluator will identify a 12" plastic rule and demonstrate how to measure to the nearest inch, half-inch, quarter-inch, and eighth-inch. Answer any questions at this time; however, avoid *"teaching"* the student to measure by giving repeated demonstrations. (See Figure 1.)

Special Instructions: Lines for Tasks 1 - 4 should measure 3", 3½", 3¼", and 3⅛", respectively, and should be drawn on a separate sheet of paper.

Figure 1.

Task 1: _____*

Task 2: _____*

Task 3: _____*

Task 4: _____*

Tasks 1 through 4

Given a 12" plastic rule and measuring tasks 1, 2, 3, and 4, the student will measure the line in each task and tell his/her findings to the evaluator.

*Lines are drawn by evalutor on separate sheet of paper.

Preliminary Exercise:

The evaluator will identify the 12″ carpenter square and demonstrate how to draw a square on 8½″ x 14″ unruled paper. (See Figure 2.)

Special Instructions: *Have student stand to one side* - **not facing you** - *while you demonstrate this task.*

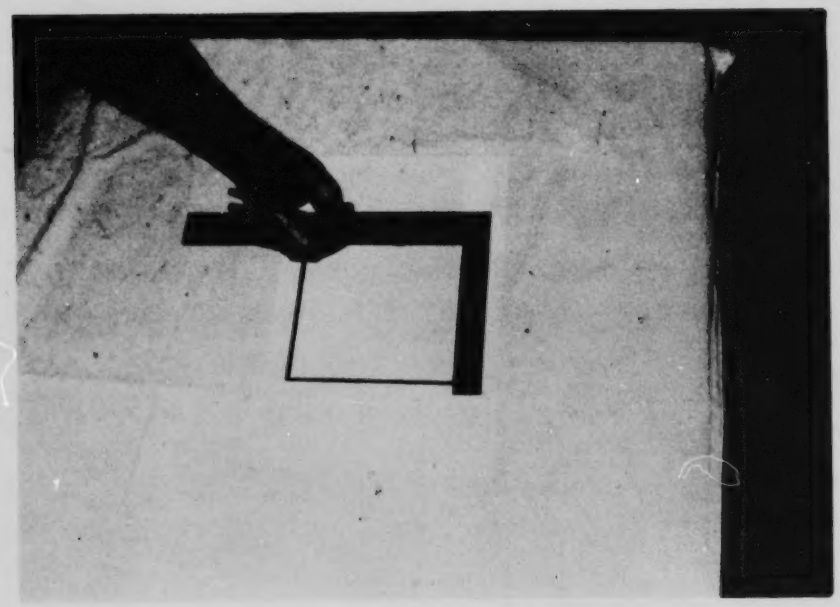


Figure 2.

Task 5

Given a 12″ carpenter square and a #2 lead pencil, the student will draw a 6″ x 6″ square on 8½″ x 14″ unruled paper, to a tolerance of ⅛″. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate the use of the combination square as a simple cross square. (See Figure 3.)

Special Instructions: Mark (X) on paper at point where wood is to be squared by student.

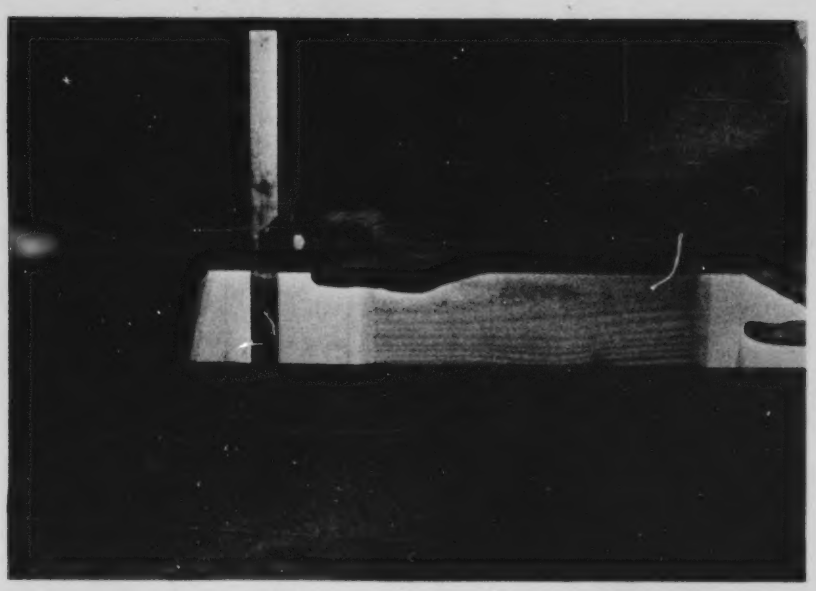


Figure 3.

Task 6

Given 2″ x 4″ wood stock from the kit, (paper taped on both ends) and combination square the student will square both ends (where marked by evaluator) using the combination square, to a tolerance of ⅛″. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate the use of 3″ adjustable "C" clamps for securing materials to be sawed. (See Figure 4.)

Special Instructions: Open each "C" clamp fully before each task.

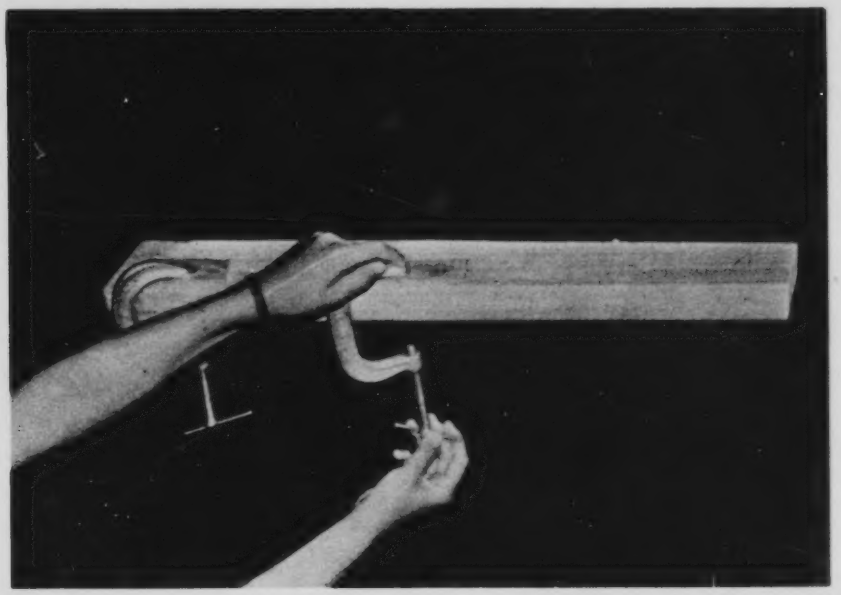


Figure 4.

Task 7

Using two adjustable 3″ "C" clamps, (fully opened) two pieces of plywood (2″ x 2″) and 2″ x 4″ scrap wood stock, the student will clamp the material to a suitable table or work bench. **Note time!** (Leave clamped for Task 8.)

Preliminary Exercise:

The evaluator will identify a 26″ handsaw and demonstrate for the student the techniques of starting a saw into the wood and how to saw "on-the-line." (See Figure 5.)

Special Instructions: Use combination square to draw two lines (one for preliminary exercise and one for student's task).

Figure 5.

Task 8

Given a 26″ handsaw and securely clamped 2″ x 4″ wood stock from task 7 the student will saw "on-the-line" until the material has been sawed into two parts. **Note time!**

Preliminary Exercise:

The evaluator will explain and demonstrate the use of the miter box for sawing miter joints. (See Figure 6.)

Special Instructions: *Student will cut off one end of the i" x 4" x 30" (or longer) scrap wood stock. Evaluator will assist student by premarking the wood and placing material in miter box.*

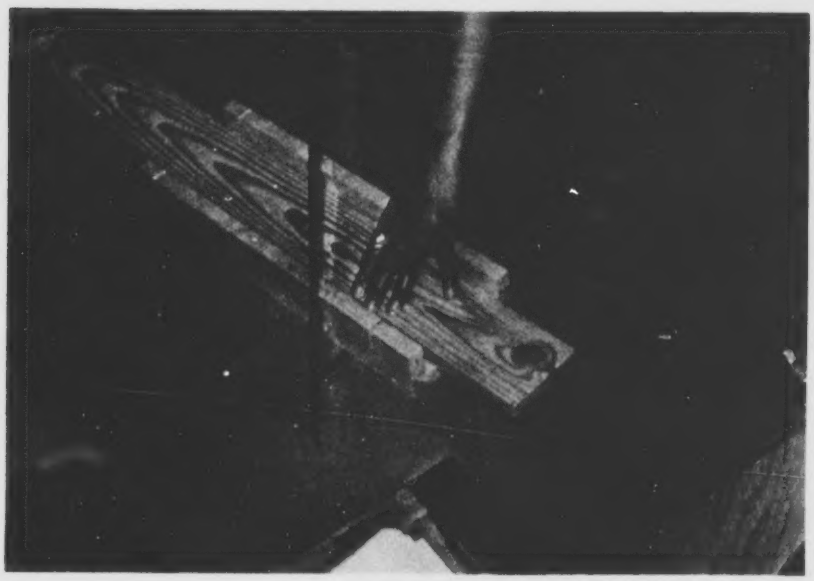


Figure 6.

Task 9

Given the miter box, handsaw, and scrap 1" x 4" wood stock (premarked) placed in miter box, the student will saw a 45° face miter. **Note time!**

Preliminary Exercise:

The evaluator will identify the ratchet brace, demonstrate how to insert the ¼" auger bit, and use it to drill a hole. (See Figure 7.)

Special Instructions: *Clamp 2" x 4" material to table with approximately 8" extending beyond edge of table. Use cardboard pattern with four premarked holes to mark where holes are to be drilled. Instruct student to apply downward pressure on brace while turning clockwise. Demonstrate how to reverse ratchet brace. Time ends with drill bit out of last hole. Have student remove loose fitting jacket etc., and stand to side of evaluator while task is being demonstrated.*

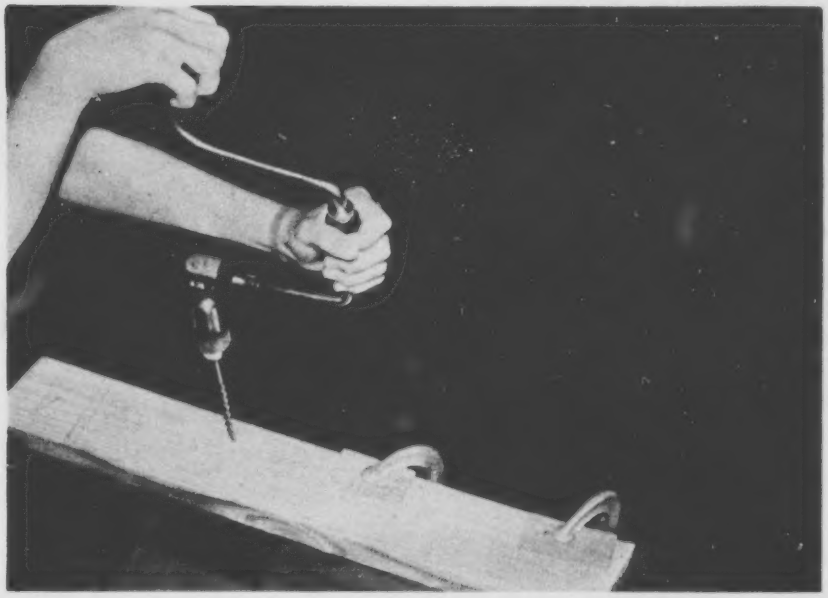


Figure 7.

Task 10

Given a ratchet brace and a ¼" auger bit inserted by the evaluator, the student will bore three holes through the premarked clamped 2" x 4" materail. **Note time!** (Retain bored wood for task 11.)

Preliminary Exercise:

The evaluator will demonstrate how to start lag bolts into a 2″ x 4″ wood block using an 8″ adjustable wrench. (See Figure 8.)

Special Instructions: *Begin screwing bolt into wood with fingers and instruct student to do one bolt at a time. Use material from task #10 with three holes drilled.*

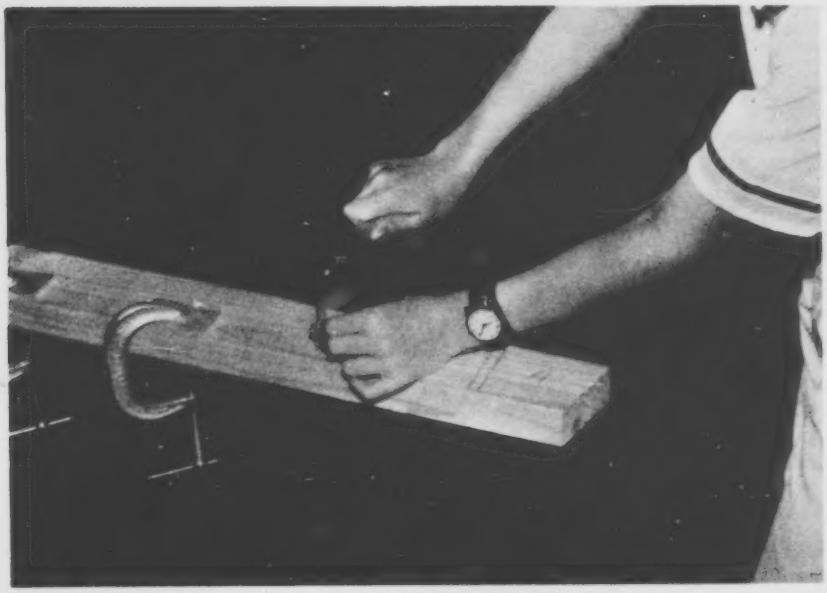


Figure 8.

Task 11

Given an 8″ adjustable wrench and three lag bolts ⅜″ x 3″, the student will screw lag bolts (one at a time) through the drilled holes until bolt tips appear on opposite side of material. **Note time!**

Preliminary Exercise:

Using two pre-drilled 2″ x 4″ wood blocks from kit, the evaluator will demonstrate how to fasten them together using lag bolts. (See Figure 9.)

Special Instructions: *Instruct student to tighten bolts until heads of bolts touch wood. After this task give student a 10-minute break. Assemble level/plumb apparatus during the break. Pre-drilled 2″ x 4″ wood blocks should be discarded after use by six students.*

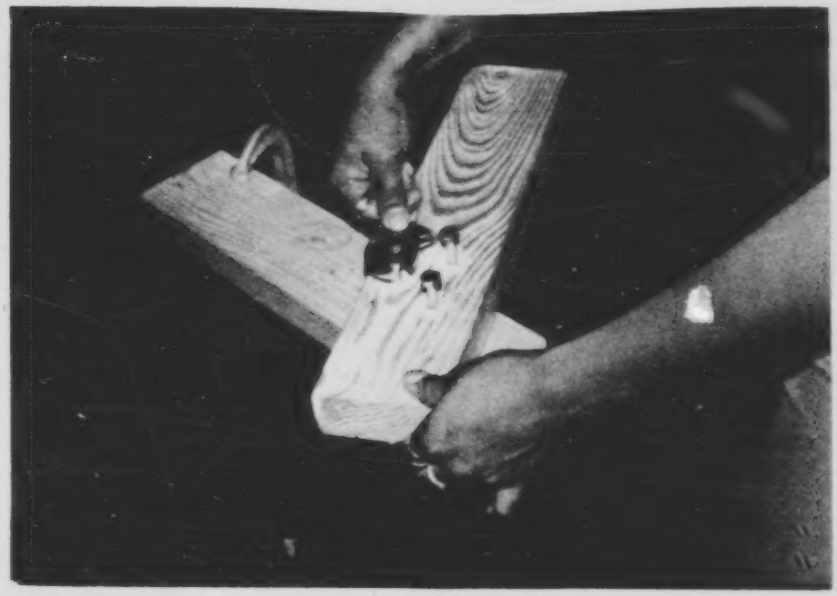


Figure 9.

Task 12

Given two pieces of 2″ x 4″ material with holes pre-drilled (bottom piece clamped to the table), an 8″ adjustable wrench, and three lag bolts, the student will match the holes and bolt the two pieces of material together until bolt heads touch the 2″ x 4″ material. **Note time!**

Preliminary Exercise:

The evaluator will identify the ratchet screwdriver/drill, attach the 9/64 drill point, and demonstrate its use. (See Figure 10.)

Special Instructions: *Use cardboard pattern with seven holes for marking the six pilot holes. The evaluator will drill a single hole for the preliminary exercise. Evaluator should drill bit for correct depth (approximately ¾").*

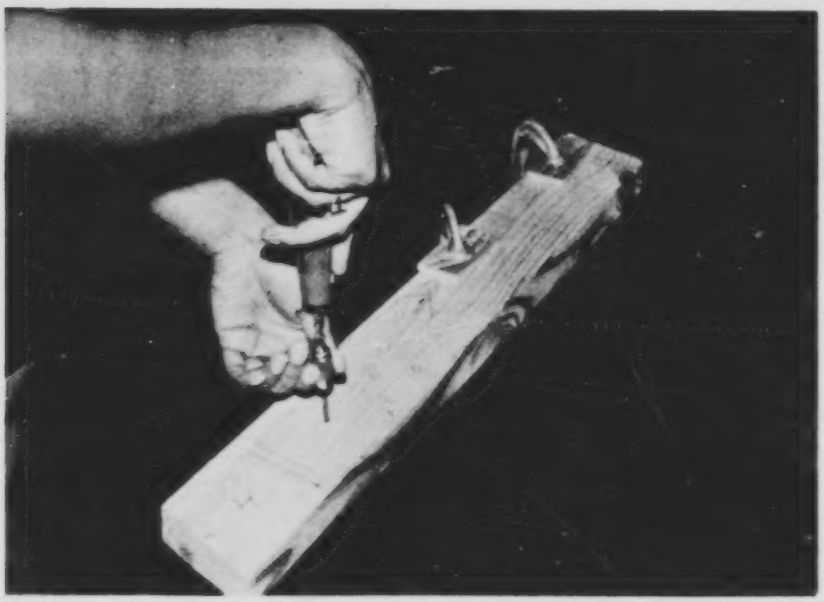


Figure 10.

Task 13

Given a ratchet screwdriver/drill, a 9/64 drill point inserted by the evaluator, the student will drill six pilot holes ¾" deep in the secured and premarked 2" x 4" material. Save for task 14. **Note time!**

Preliminary Exercise:

The evaluator will identify the ½" countersink and hand drill, attach the countersink to the hand drill, and demonstrate how to countersink pilot holes. (See Figure 11.)

Special Instructions: *Use #2 kiln dried white pine - do not mark drill sites over knots, etc.*

Figure 11.

Task 14

Given a hand drill and a ½" countersink (evaluator inserts countersink) the student will countersink the pilot holes which were drilled in Task 13. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to drive 1" wood screws using a flat blade ¼" screwdriver. (Evaluator should check pilot holes for proper depth before student inserts screws.) (See Figure 12.)

Special Instructions: Use new screws with each student.

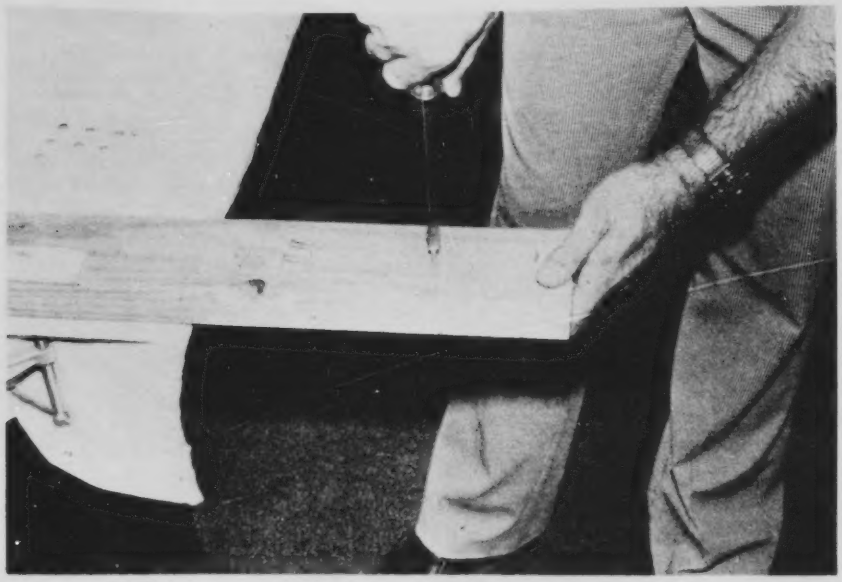


Figure 12.

Task 15

Given a flatblade ¼" screwdriver, the student will drive three 1" wood screws into three of the countersunk pilot holes until head of screw is below surface and then remove them. **Note time!**

Preliminary Exercise:

The evaluator will identify the claw hammer and demonstrate its use in driving common 8d nails. (See Figure 13.)

Special Instructions: *Place an "X" where each nail should be driven by the student.* **Wear safety glasses!**

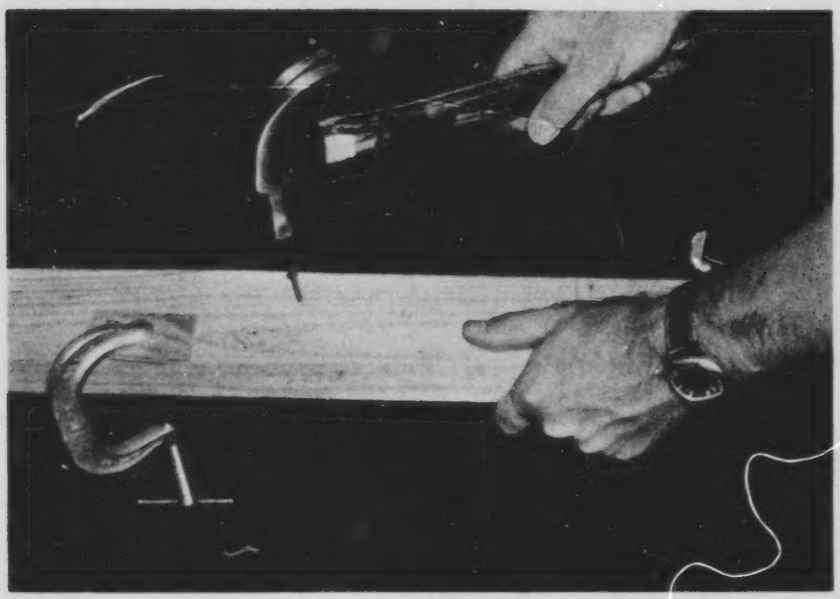


Figure 13.

Task 16

Given a claw hammer, securely clamped (scrap) 2" x 4" lumber, safety glasses, and four #8d common nails, the student will drive each nail flush into the wood. **Note time!**

Preliminary Exercise:

The evaluator will identify the claw hammer and demonstrate how to remove a common nail. (See Figure 14.)

Special Instructions: **Have the student wear safety glasses!** *The evaluator should drive four 8d nails into the wood until approximately 1" of each nail nail remains exposed. Use #2 white pine and do not drive nails into knots.*

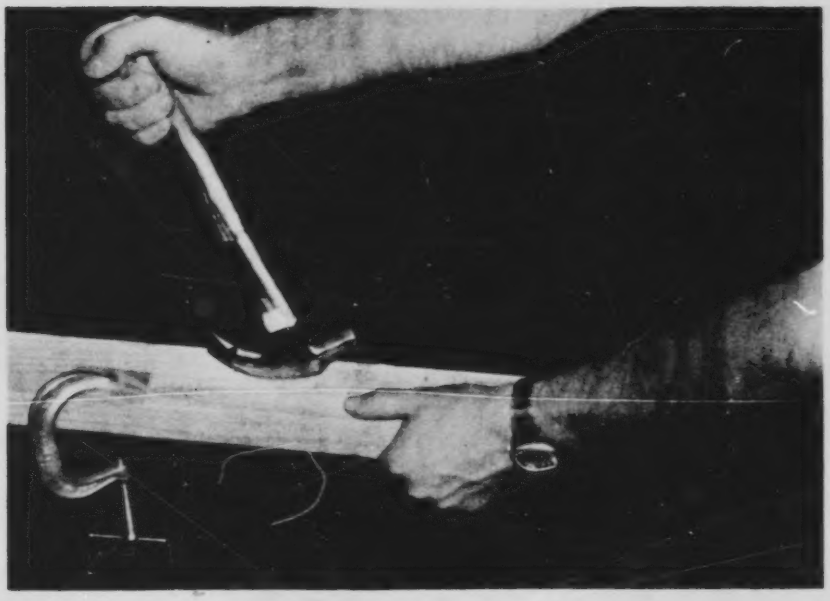


Figure 14.

Task 17

Given a claw hammer, securely clamped (scrap) 2" x 4" lumber, safety glasses, and four #8d common nails, the student will remove each nail. **Note time!**

Preliminary Exercise:

The evaluator will identify the 8" torpedo level and demonstrate how to plumb the two vertical beams and level the horizontal beam (K). (See Figure 15.)

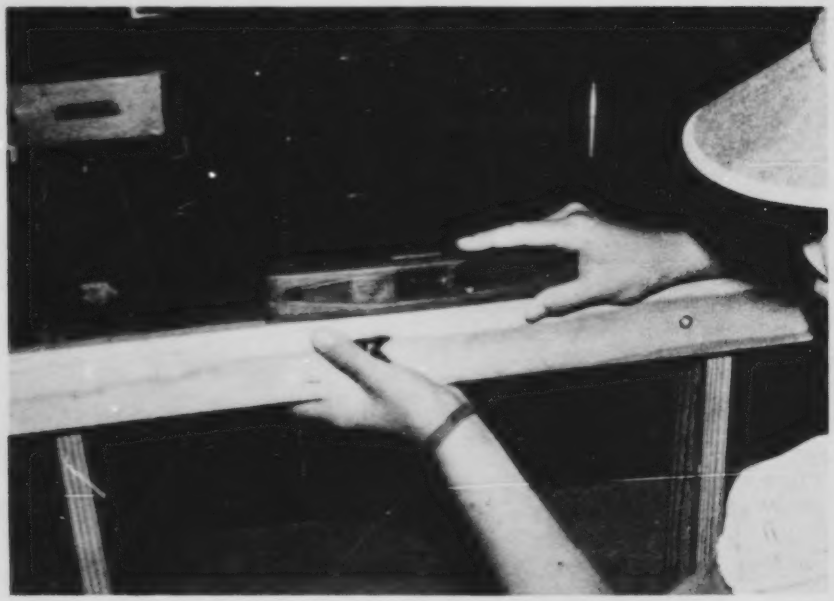


Figure 15.

Task 18

Given an 8" torpedo level and the level/plumb apparatus, the student will: plumb the two vertical beam and level beam (K). **Note total time!**

Preliminary Exercise:

The evaluator will identify the coping saw and demonstrate its use for cutting intricate curves and designs in plywood. (See Figure 16.)

Special Instructions: *Polygon should be drawn on plywood with two points away from edge of table. (Use a 5" wide strip of ¼" plywood approximately 30" long and draw several polygons.)*

Figure 16.

Task 19

Given a coping saw and a pre-drawn polygon on ¼" plywood (clamped to the table), the student will saw polygon (premarked) and remove it from the clamped material. **Note time!**

VOCATIONAL EDUCATION READINESS TEST (VERT)
SCORING RESULTS SHEET

NAME: _____

CARPENTRY

Measurement Skills (for tasks 1 - 4, check (✓) the appropriate column)

	Response*		Handicapped Response**		Regular Response **	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Task 1 (Inch)	_____	_____	15	0	15	0
Task 2 (Half-Inch)	_____	_____	15	0	15	0
Task 3 (Quarter-Inch)	_____	_____	15	0	15	0
Task 4 (Eighth-Inch)	_____	_____	14	1	15	0

Student Performance Data (beginning with task 5, record the completion time in seconds)

	TIME*	MEAN HANDICAPPED TIME**	MEAN REGULAR TIME**
Task 5	_____	28	18
Task 6	_____	50	44
Task 7	_____	83	60
Task 8	_____	125	92
Task 9	_____	116	96
Task 10	_____	168	125
Task 11	_____	244	180
Task 12	_____	171	97
Task 13	_____	127	77
Task 14	_____	272	186
Task 15	_____	221	225
Task 16	_____	62	59
Task 17	_____	26	21
Task 18	_____	66	49
Task 19	_____	260	199

* Write N/C should the student be unable to complete the task.

** These comparative scores were taken from statistical tables in this User's Manual.

COMMENTS:

Rx:

HOME ECONOMICS
(CLOTHING)

Objective(s):

1. To determine the student's ability to measure in inches, half-inches, quarter-inches, and eighth-inches using a 12″ measuring rule.
2. To determine the student's ability to place appropriate colored pegs into correspondingly colored slots in a pegboard.
3. To determine the student's ability to match pre-cut patterns in appropriate form-board slots.
4. To determine the student's ability to sew between pre-drawn parallel lines.
5. To determine the student's ability to thread four (4) needles using dual-duty thread.
6. To determine the student's ability to pin and properly cut a pattern.

Tools Needed:

One 12″ plastic ruler

One exercise sheet (8½″ x 11″) containing pre-drawn patterns and lines of varying lengths

Four spools of dual-duty thread

Two scissors (left and right hand)

Four straight pins

One sheet of 8½″ x 11″ paper with lines drawn to 3″, 3½″, 3¼″, and 3⅛″.

One form board and pre-cut patterns

One multi-colored pegboard and appropriate number of pegs

One pattern

One needle holder

One blank piece of 8½″ x 14″ paper (simulated cloth)

Preliminary Exercise:

The evaluator will identify a 12" plastic rule and demonstrate how to measure to the nearest inch, half-inch, quarter-inch, and eighth-inch. Answer any questions at this time; however, avoid *"teaching"* the student to measure by giving repeated demonstrations. (See Figure 1.)

Special Instructions: Lines for Tasks 1 - 4 should measure 3", 3½", 3¼", and 3⅛", respectively, and should be drawn on a separate sheet of paper.

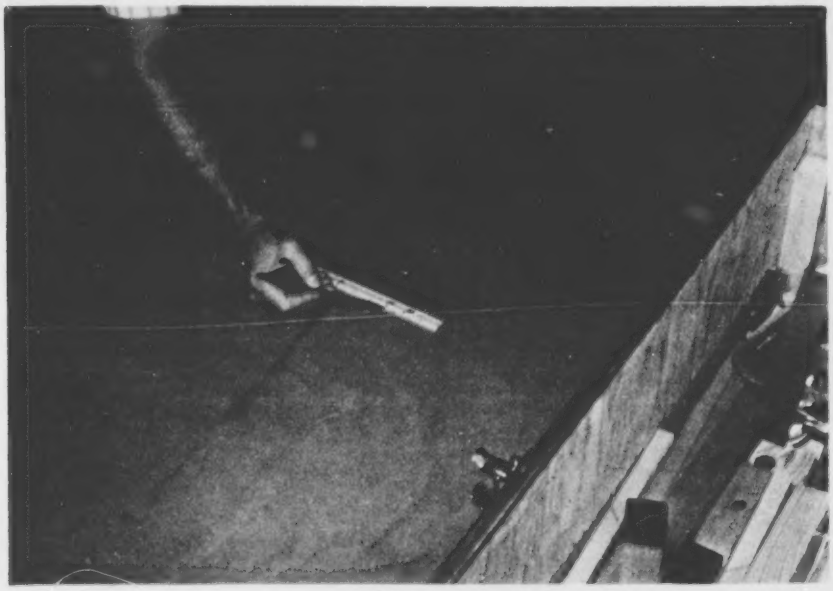


Figure 1.

Task 1: _____*

Task 2: _____*

Task 3: _____*

Task 4: _____*

Tasks 1 through 4

Given a 12" plastic rule and measuring tasks 1, 2, 3, and 4, the student will measure the line in each task and tell his/her findings to the evaluator.

*Lines are drawn on separate sheet to respective length by evaluator.

Preliminary Exercise:

The evaluator should identify the pegboard and pegs and demonstrate (partially) the placement of the pegs in the pegboard. (See Figure 2.)

Special Instructions: *The evaluator should see that each of the colored pegs is placed on the pegboard within the appropriate colored area. After completion of the exercise, the evaluator should indicate on the scoring sheet in the "comments" section whether or not the colors match, i.e., peg and pegboard colors.*

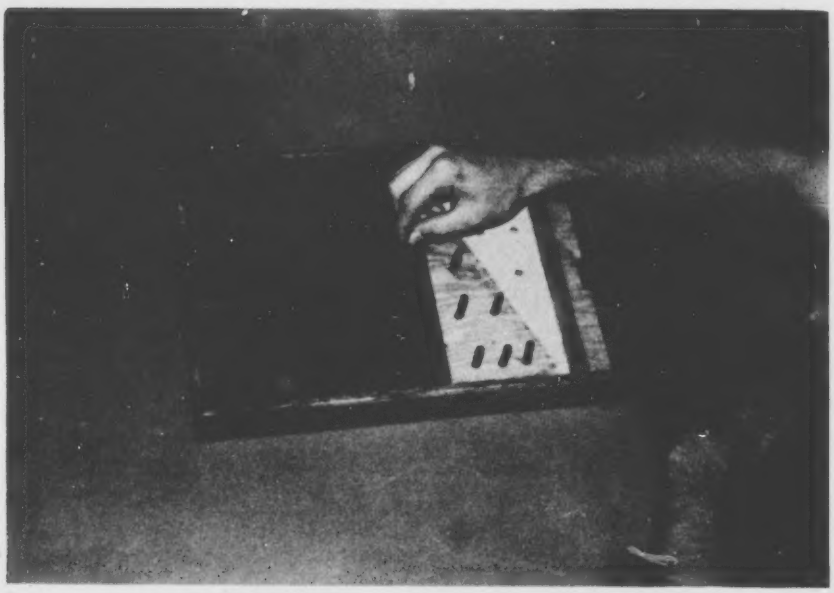


Figure 2

Task 5

Given 36 colored pegs (mixed) and a color-coded pegboard, the student will place all pegs in the pegboard in their appropriate color slots. **Note time!**

Preliminary Exercise:

The evaluator should identify the form board and pre-cut patterns and demonstrate the appropriate procedure for completing the exercise. (See Figure 3.)

Special Instructions: *The evaluator should explain to the student that the patterns may be placed in the appropriate slots of the form board in any order.*

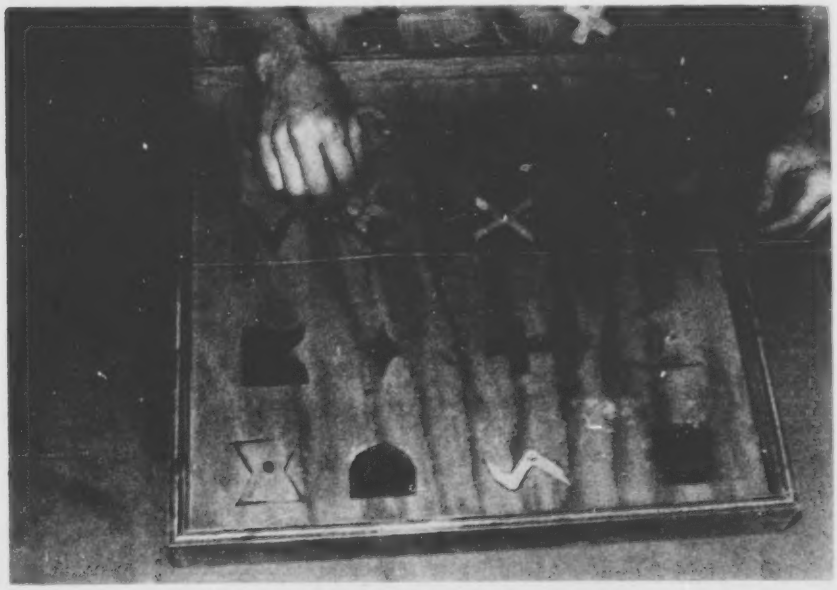


Figure 3.

Task 6

Given the pre-cut patterns and the form board, the student will place each pattern in the appropriate slot on the form board. **Note time!**

Preliminary Exercise:

The evaluator should identify both the exercise sheet and sewing machine simulator and demonstrate the appropriate method of completing the exercise. (See Figure 4.)

Special Instructions: *The evaluator should emphasize to the student that the pencil line should remain within the pre-drawn parallel lines at all times. The evaluator should also tell the students that the exercise sheet should be pivoted to permit a continuous and forward movement rather than sliding the exercise sheet at angles. Pivoting the exercise sheet more closely simulates the movement of cloth through a sewing machine.*

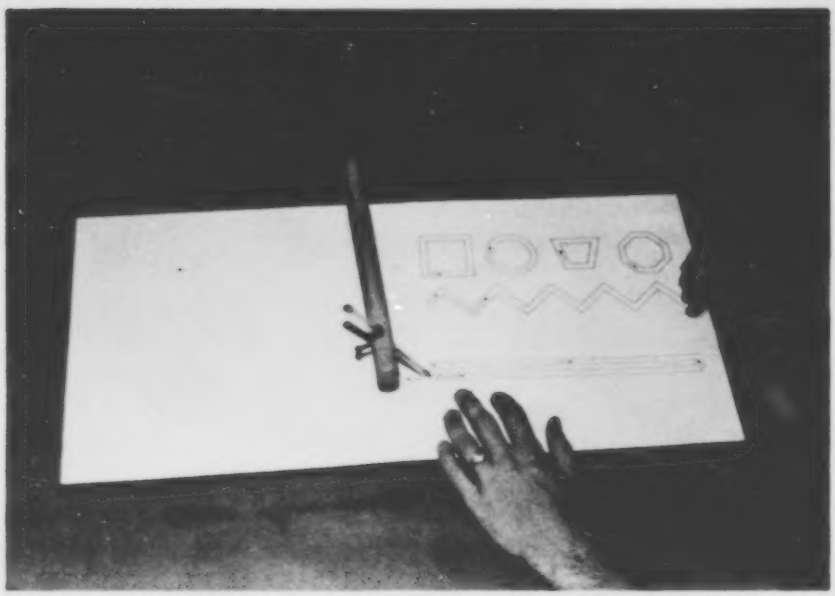


Figure 4.

Task 7

Given a simulated sewing machine and the exercise sheet containing the patterns of parallel lines, the student will draw a continuous pencil line between the parallel lines throughout the pattern. **Note time!**

Preliminary Exercise:

The evaluator should identify the needle holder and demonstrate how to thread a needle. (See Figure 5.)

Special Instructions: *Instruct the student to thread the needles from left to right. Also inform the student that two needles are threaded from the side and two from the front.*

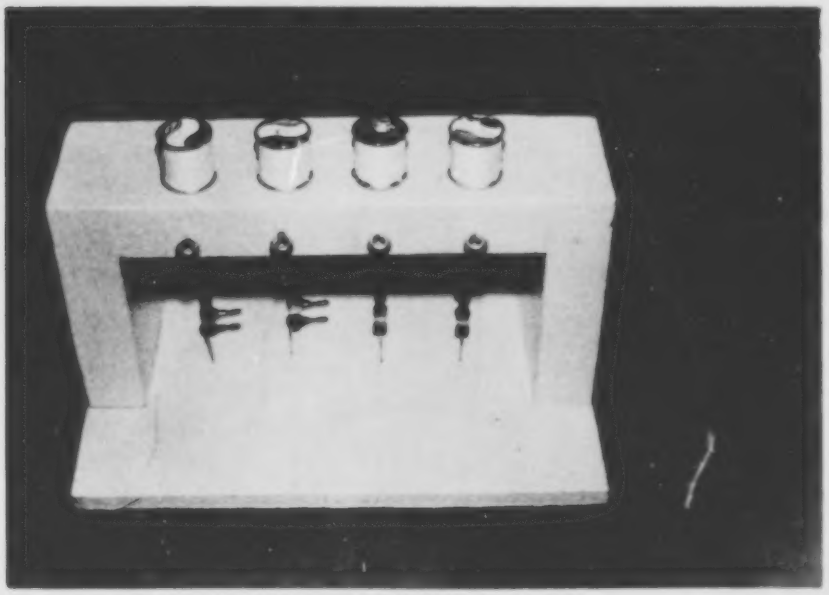


Figure 5.

Task 8

Given the needle holder, the student will thread the four needles. **Note time!**

Preliminary Exercise:

The evaluator should identify the simulated cloth (8½" x 14" blank paper) and the pattern. Inform the student that the pattern is to be pinned and cut from the simulated cloth. (See Figure 6.)

Special Instructions: The evaluator should tell the student that the pattern is to be cut along the line as indicated in Figure 6. The evaluator should inform the student where to place the pins by marking the pattern. In addition, the evaluator should determine the type of scissors (left or right handed) to be used by the student.

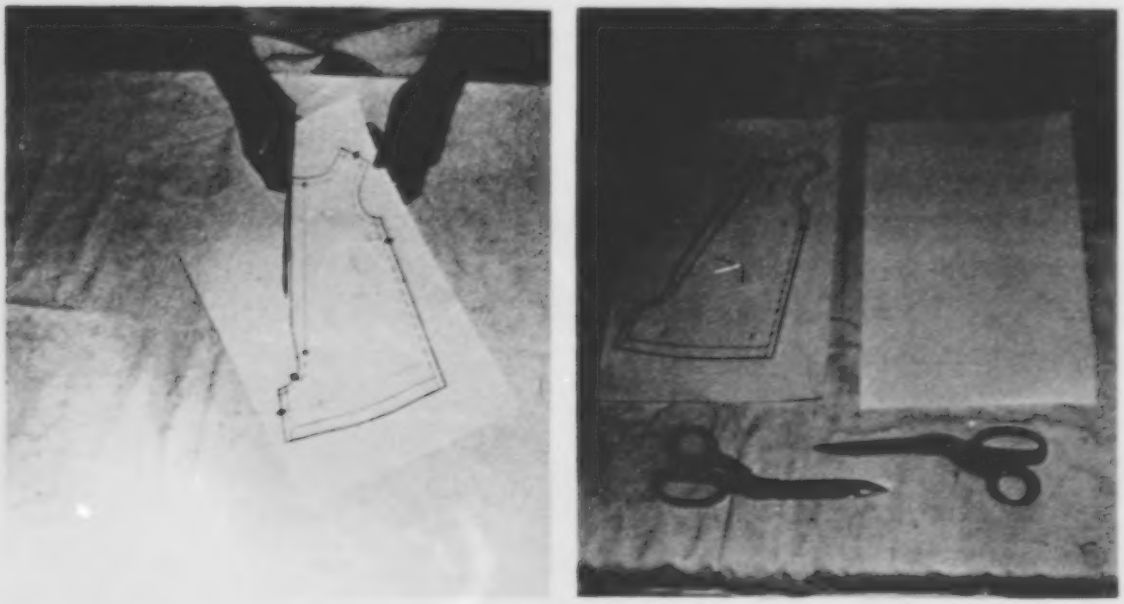


Figure 6.

Task 9

Given four straight pins, one pattern, simulated cloth (8½" x 14" blank paper), and a pair of scissors, the student will pin the pattern to the simulated cloth and cut the pattern along the large black line. **Note time!**

VOCATIONAL EDUCATION READINESS TEST (VERT)
SCORING RESULTS SHEET

NAME: _____

CLOTHING

Measurement Skills (for tasks 1 - 4, check (✓) the appropriate column)

	Response*		Handicapped Response**		Regular Response **	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Task 1 (Inch)	_____	_____	15	0	15	0
Task 2 (Half-Inch)	_____	_____	4	11	15	0
Task 3 (Quarter-Inch)	_____	_____	2	13	15	0
Task 4 (Eighth-Inch)	_____	_____	3	12	15	0

Student Performance Data (beginning with task 5, record the completion time in seconds)

	TIME*	MEAN HANDICAPPED TIME**	MEAN REGULAR TIME**
Task 5	_____	90	55
Task 6	_____	93	51
Task 7	_____	255	132
Task 8	_____	172	101
Task 9	_____	256	185

* Write N/C should the student be unable to complete the task.

** These comparative scores were taken from statistical tables in this **User's Manual.**

COMMENTS: _____

_____

_____

_____

_____

Rx: _____

_____

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MASONRY

Objective(s):

1. To determine student's ability to measure in inches, half-inches, quarter-inches, and eighth-inches.
2. To determine student's ability to move and stack 49 common brick.
3. To determine student's ability to spread and furrow mortar with a masonry trowel.
4. To determine student's ability to lay a dry wall of brick on a straight line and plumb, with ⅛" open joints.
5. To determine student's ability to lay dry courses of brick in corner construction.
6. To determine student's ability to lay paving brick.
7. To determine student's ability to move and stack 8" concrete blocks.
8. To determine student's ability to lay a dry wall of 8" concrete blocks with open joints on a straight line.

Tools Needed:

Approximately 60 whole common bricks (furnished locally)

Sand and slacked lime (furnished locally). (Approximately three sand to one slacked lime with adequate water)

Masonry Trowel

One 2" x 4" stud 8' long (furnished locally)

Mortar board (32" x 32")

⅛" spacer (plywood strip ⅜" x 2" x 6")

Brick tongs (adjusted for seven bricks)

24" magnesium spirit level

White or blue chalk

Twelve 8" x 8" x 16" concrete blocks

Two 20" x 40" pieces of plywood (½") for brick and block bases.

One wood pallet (28" x 64" x 4") premarked by evaluator for brick wall and corner and block wall (Use 2" x 4" frame and ⅝" exterior plywood)

12" plastic ruler

Preliminary Exercise:

The evaluator will identify a 12" plastic rule and demonstrate how to measure to the nearest inch, half-inch, quarter-inch, and eighth-inch. Answer any questions at this time; however, avoid *"teaching"* the student to measure by giving repeated demonstrations. (See Figure 1.)

Special Instructions: Lines for Tasks 1 - 4 should measure 3", 3½", 3¼", and 3⅛", respectively, and should be drawn on a separate sheet of paper.

Figure 1.

Task 1: _____*

Task 2: _____*

Task 3: _____*

Task 4: _____*

Tasks 1 through 4

Given a 12" plastic rule and measuring tasks 1, 2, 3, and 4, the student will measure the line in each task and tell his/her findings to the evaluator.

*Lines are drawn on separate sheet to respective length by evaluator.

Preliminary Exercise:

The evaluator will identify a stack of 49 common bricks and demonstrate the correct method of carrying bricks using brick tongs (brick tongs set for seven bricks). (See Figure 2.)

Special Instructions: Evaluator should measure a distance of 12', place a marker at that point, and have student carry bricks (from side #1 of the brick base) around the marker and place them back on the plywood base, side #2

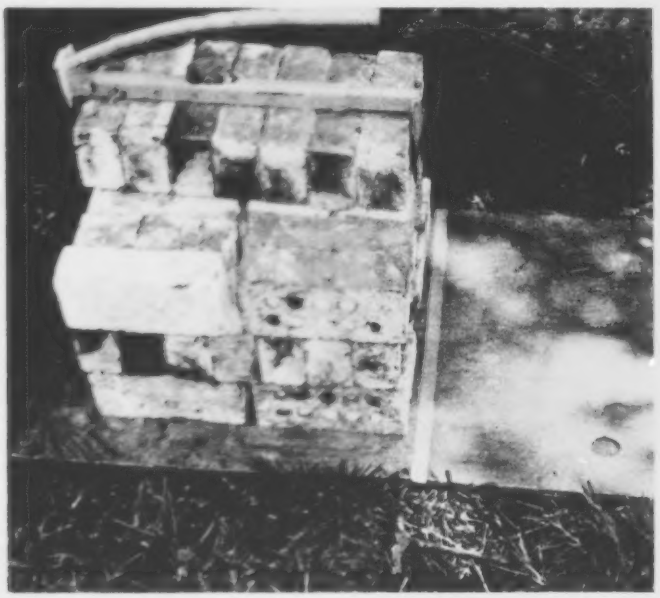

Figure 2.

Task 5

Given a stack of 49 bricks sitting on side #1 of the brick base and brick tongs (adjusted to carry seven bricks) the student will move the bricks (seven at a time) a distance of 25' around the marked pathway and restack them on side #2 of the brick base. **Note time!**

Preliminary Exercise:

The evaluator will identify the masonry trowel and demonstrate the correct procedure for spreading and furrowing mortar on a 2" x 4" stud 8' long. **(This is the only task requiring the use of mortar!)** (See Figure 3.)

Special Instructions: Evaluator should mark the stud 1' from each end so that the student will spread and furrow mortar a distance of 6'. Stud should be approximately 6" above ground.

Figure 3.

Task 6

Given a masonry trowel, mortar board, prepared mortar, and a premarked 2" x 4" stud, the student will lay and furrow a 6' bed of mortar on the stud. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to construct and plumb a five course brick wall (without mortar) approximately 3′ in length with ⅜″ joints. (See Figure 4.)

Special Instructions: The dimensions for this wall should be premarked on the pallet.

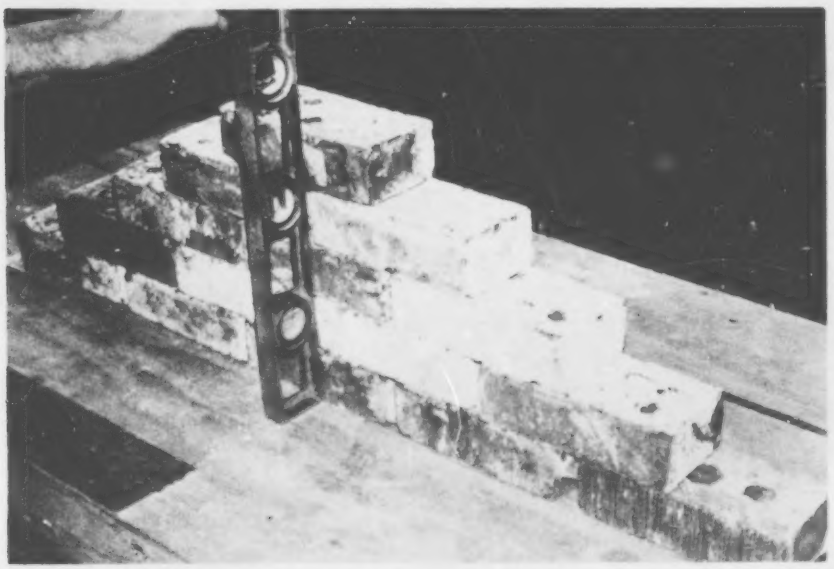

Figure 4.

Task 7

Given approximately 15 bricks, a ⅜″ plywood joint spacer, a pallet with length of wall premarked, and a 24″ spirit level, the student will construct and plumb a single dry wall five courses high, 3′ long with ⅜″ joints. **Note time!**

Preliminary Exercise:

The evaluator, using ⅜" plywood joint spacer, brick pallet, and a spirit level, will demonstrate how to lay a single dry brick corner wall seven courses high. (See Figure 5.)

Special Instructions: Brick corner should be marked on the pallet by evaluator — 28" x 32".

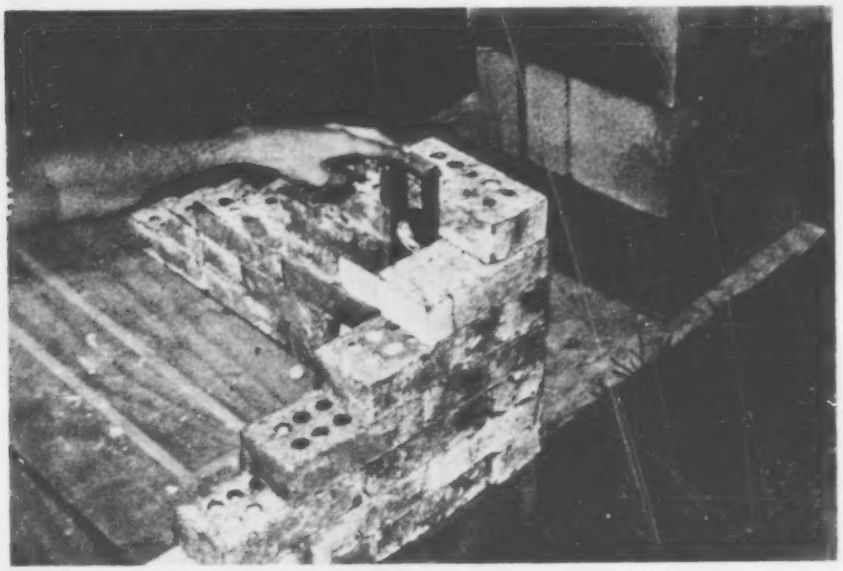

Figure 5.

Task 8

Given 28 common bricks, a 26" x 64" premarked pallet, ⅜" plywood joint spacer, and a spirit level, the student will construct and plumb a dry corner wall seven courses high. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to lay a basket weave paving design on the mortar board. (See Figure 6.)

Special Instructions: Use mortar board for paving base (32" x 32").

Figure 6

Task 9

Given 32 common bricks, a 32" x 32" mortar board and ⅜" plywood spacer, the student will pave an area 32" x 32" using the basket weave paving design. **Note time!**

Preliminary Exercise:

The evaluator will identify a stack of 12 concrete blocks (8" x 8" x 16") and demonstrate the correct method of carrying blocks by hand. (See Figure 7.)

Special Instructions: *Have the student carry two blocks at a time from side #1 of the plywood block base, around the path and return and stack them on side #2 of the plywood base.*

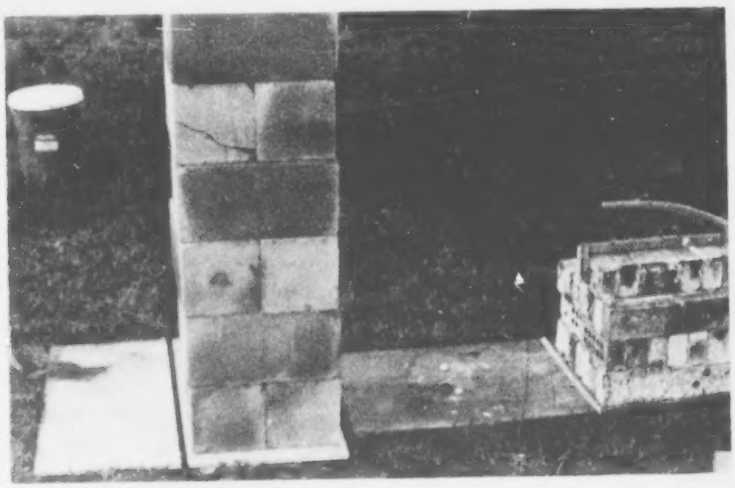

Figure 7.

Task 10

Given a stack of 12 concrete blocks (8" x 8" x 16"), the student will move the blocks (from side #1 of the plywood base), two at a time, and carry them around the pathway a distance of 25' and restack them on side #2 of the plywood base. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to construct and plumb a four course (8" x 8" x 16") concrete block wall (without mortar) approximately 5' in length (10 blocks required). (See Figure 8.)

Special Instructions: Use premarked 28" x 64" pallet as base for this task.

Figure 8

Task 11

Given approximately 10 concrete blocks (8" x 8" x 16"), a premarked pallet, and a spirit level, the student will construct and plumb a single dry wall of concrete blocks four courses high and approximately 5' in length. **Note time!**

VOCATIONAL EDUCATION READINESS TEST (VERT)

SCORING RESULTS SHEET

NAME: _____

MASONRY TEST

Measurement Skills (for tasks 1 - 4, check (✓) the appropriate column)

	Response*		Handicapped Response**		Regular Response *	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Task 1 (Inch)	_____	_____	15	0	18	0
Task 2 (Half-Inch)	_____	_____	5	10	18	0
Task 3 (Quarter-Inch)	_____	_____	1	14	14	4
Task 4 (Eighth-Inch)	_____	_____	0	15	12	6

Student Performance Data (beginning with task 5, record the completion time in seconds)

	TIME*	MEAN HANDICAPPED TIME**	MEAN REGULAR TIME
Task 5	_____	118	95
Task 6	_____	56	46
Task 7	_____	139	105
Task 8	_____	296	172
Task 9	_____	323	209
Task 10	_____	121	118
Task 11	_____	202	129

* Write N/C should the student be unable to complete the task.

** These comparative scores were taken from statistical tables in this **User's Manual.**

COMMENTS: _____

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PLUMBING

Objective(s):

1. To determine the student's ability to measure with a 12″ rule.
2. To determine student's ability to use ¾″ to ½″ pipe reducers in combination with ¾″ plugs and ½″ nipples.
3. To determine student's ability to use ½″ elbows with ½″ plugs, nipples, and caps.
4. To determine student's ability to use ½″ unions with ½″ nipples.
5. To determine student's ability to use 10″ and 14″ pipe wrenches.
6. To determine student's ability to assemble plumbing components as depicted in a diagram.
7. To determine student's ability to cut ⅜″ copper tubing with a tubing cutter.
8. To determine student's ability to flare ⅜″ copper tubing with a flaring tool.
9. To determine student's ability to use brass fittings and adjustable wrenches with flared copper tubing.
10. To determine student's ability to assemble PVC piping components.

Tools Needed:

45° flaring tool
Tubing cutter
Two 12″ lengths of ⅜″ copper tubing
6″ adjustable wrench
8″ adjustable wrench
Assortment of brass fittings
One ½″ Coupling (PVC)
One can of PVC pipe cleaner
One can of PVC pipe cement
One Hacksaw for cutting PVC pipe
12″ plastic ruler

Tools and Plumbing Components Needed:

One 10″ pipe wrench
One 14″ pipe wrench
Three ¾″ plugs
Five ½″ unions
Two ½″tees
Five ½″ elbows
Five ½″ caps
Three ½″ plugs
Three ¾ to ½″ reducers
One ½ x 1¼″ nipples
One ½ x 1½″ nipples
Three ½ x 2″ nipples
Two ½ x 2½″ nipples
Six ½ x 3″ nipples
One ½ x 3½″ nipples
Three ½ x 4″ nipples
One ½ x 4½″ nipples
Five ½ x 5″ nipples
Three ½ x 6″ nipples
Three ½ x 12″ nipples

Preliminary Exercise:

The evaluator will identify a 12" plastic rule and demonstrate how to measure to the nearest inch, half-inch, quarter-inch, and eighth-inch. Answer any questions at this time; however, avoid *"teaching"* the student to measure by giving repeated demonstrations. (See Figure 1.)

Special Instructions: Lines for Tasks 1 - 4 should measure 3", 3½", 3¼", and 3⅛", respectively, and should be drawn on a separate sheet of paper.

Figure 1.

Task 1: _____*

Task 2: _____*

Task 3: _____*

Task 4: _____*

Tasks 1 through 4

Given a 12" plastic rule and measuring tasks 1, 2, 3, and 4, the student will measure the line in each task and tell his/her findings to the evaluator.

*Lines are drawn on separate sheet to respective length by evaluator.

Preliminary Exercise:

The evaluator will demonstrate how to use ¼" reducers in combination with ¼" plugs and ½" x 4" nipples. (See Figure 2.)

Special Instructions: Have like components grouped together for task #5, i.e., reducers nipples, and plugs in separate but adjacent groups.

Figure 2.

Task 5

Given three each of ¼" reducers and plugs, ½" x 4" nipples, the student will assemble three duplicates of the pipe assembly which was assembled by the evaluator. **Note time!**

Preliminary Exercise:

The evalutor will demonstrate the use of ½" elbows in combination with ½" plugs, ½" x 5" nipples, and caps. (See Figure 3.)

Special Instructions: *Have like components grouped together for task #6, i.e., elbows, plugs, nipples, and caps should be placed in separate but adjacent groups.*

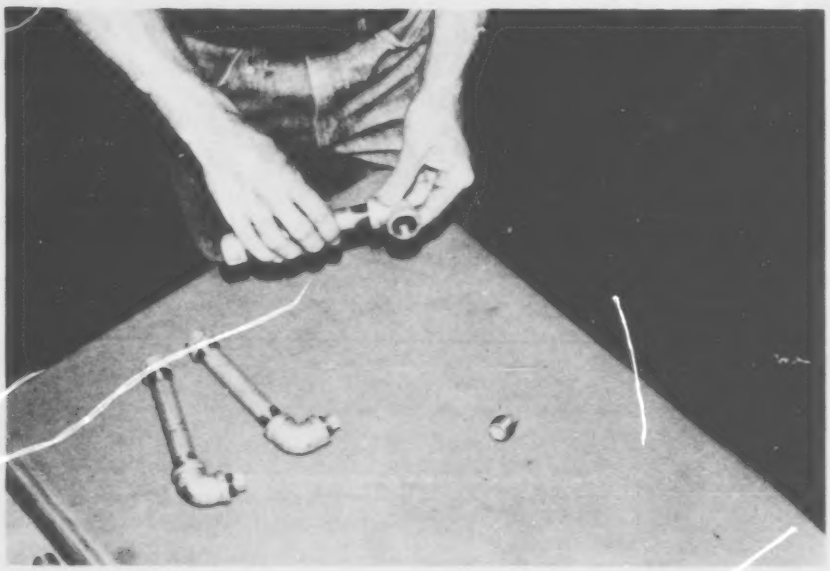

Figure 3.

Task 6

Given three each of ½" elbows, ½" x 5" nipples, ½" plugs, and ½" caps, the student will assemble three duplicates of the pipe assembly which was assembled by the evaluator. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate the use of ½" unions with ½" x 3" nipples. Put the two union ends on the nipples first, then join the union. (See Figure 4.)

Special Instruction: *The three union components and 3" nipples should be placed in separate but adjacent groups. Instruct the student that the two union end-pieces should be connected to the nipples prior to joining the union.*

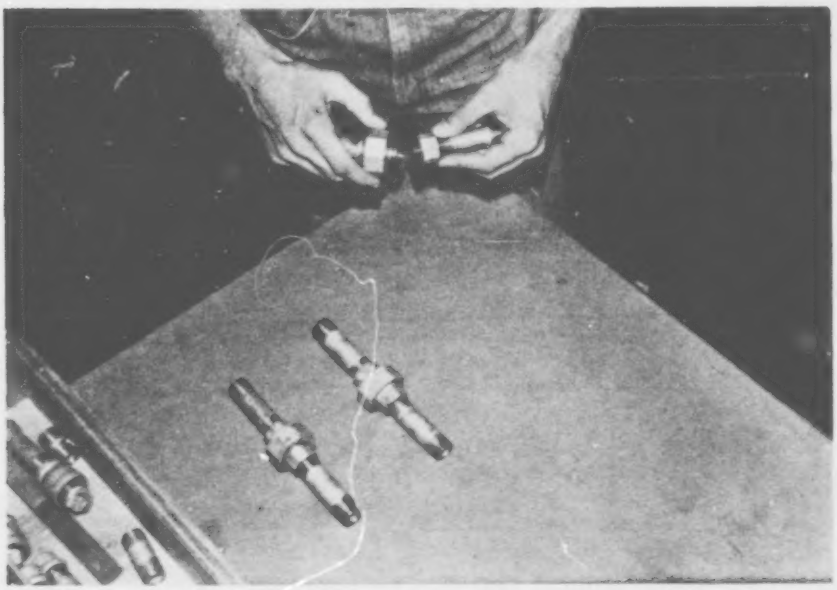

Figure 4.

Task 7

Given three ½" unions and six ½" x 3" nipples, the student will assemble three duplicates of the pipe assembly which was assembled by the evaluator. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate the use of 10″ and 14″ pipe wrenches to tighten a union joint with 3″ nipples attached. (See Figure 5.)

Special Instructions: Use one set of components to demonstrate and another for the task. Instruct students not to get wrench on pipe threads

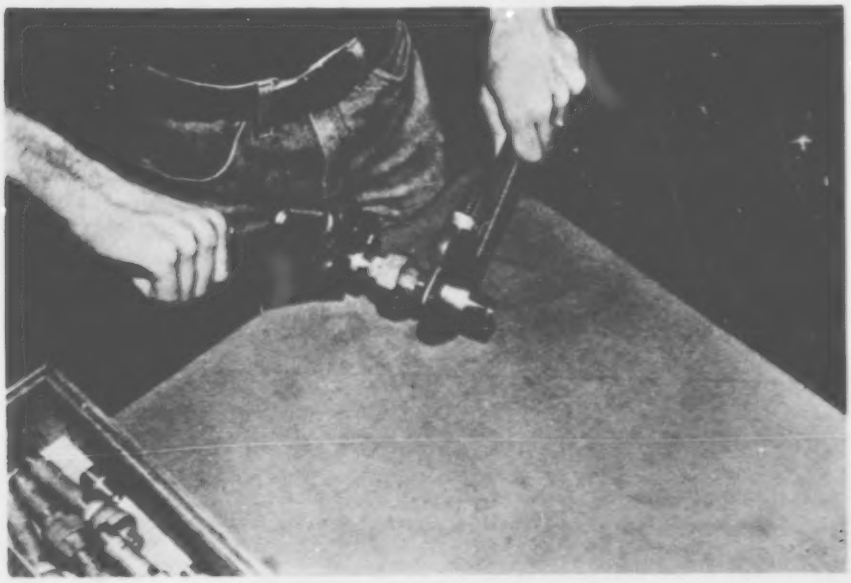

Figure 5.

Task 8

Given a ½″ union joint, two ½″ x 3″ nipples, and two pipe wrenches—10″ and 14″, respectively, the student will tighten the two nipple joint to the two ends of the union and then connect and tighten the union without putting wrenches on the table top. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate how to assemble plumbing components as illustrated. (See Figure 6.)

Special Instructions: *Have pipes assembled and let student see them and observe you taking them apart. Leave components mixed and let student use Figure 6 to assemble the pipes. At the completion of this task, the evaluator and student should take a short break to remove oil from their hands, etc.*

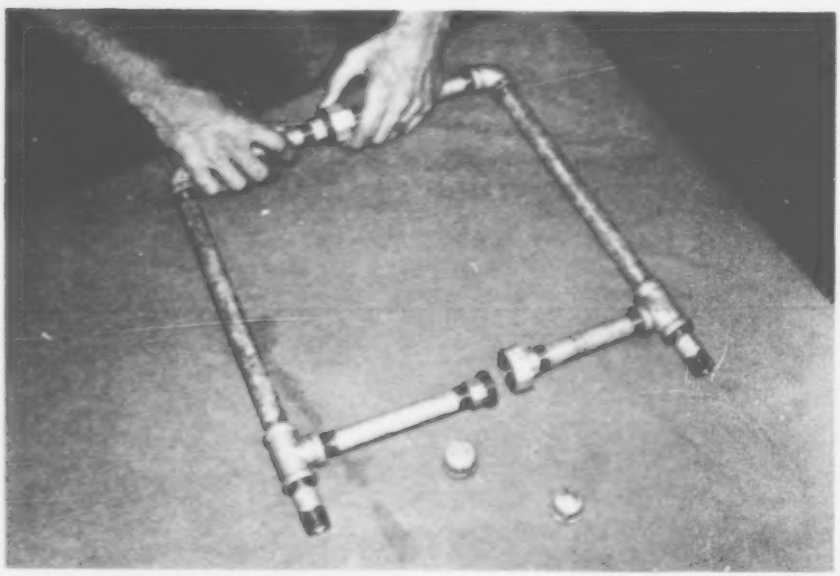

Figure 6.

Task 9

Given two each of ½" x 12" nipples, ½" x 6" nipples, ½" x 5" nipples, ½" x 2" nipples, ½" elbows, ½" unions, ½" tees, and ½" caps, the student will duplicate the pipe assembly depicted in Figure 10. **Note time!**

Preliminary Exercise:

The evaluator will identify the tubing cutter and demonstrate its use with ⅜" copper tubing. (See Figure 7.)

Special Instructions: *Instruct student to place tubing on the two rollers and to tighten the cutter with each turn.*

Figure 7

Task 10

Given a tubing cutter and two short lengths of ⅜" copper tubing, the student will cut off ½" of each tube. **Note time!**

Preliminary Exercise:

The evaluator will identify the flaring tool and demonstrate its use in flaring ⅜" copper tubing. (See Figure 8.)

Special Instructions: *Instruct the student to be certain tool is turned and locked and to turn handle several times (loosen and tighten). Instruct the student to put tubing end ⅛" out from edge of locking device.*

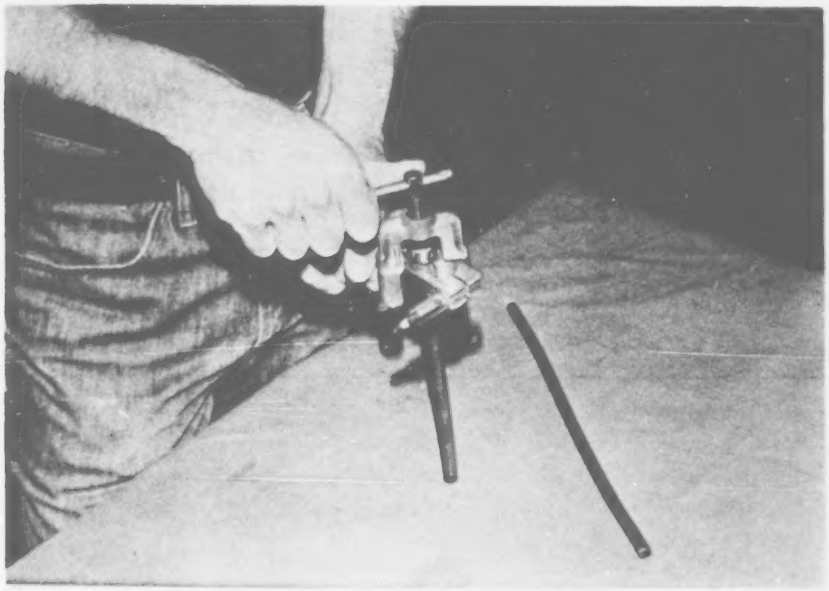

Figure 8.

Task 11

Given a flaring tool and the two short lengths of ⅜" copper tubing, the student will flare one end of each tube. **Note time!**

Preliminary Exercise:

The evaluator will demonstrate the use of adjustable wrenches and brass fittings with ⅜" copper tubing. (See Figure 9.)

Special Instructions: *The 6" adjustable wrench is to be used on the small fittings, and the 10" adjustable wrench on the union. Use the lengths of tubing which were flared in task #11.*

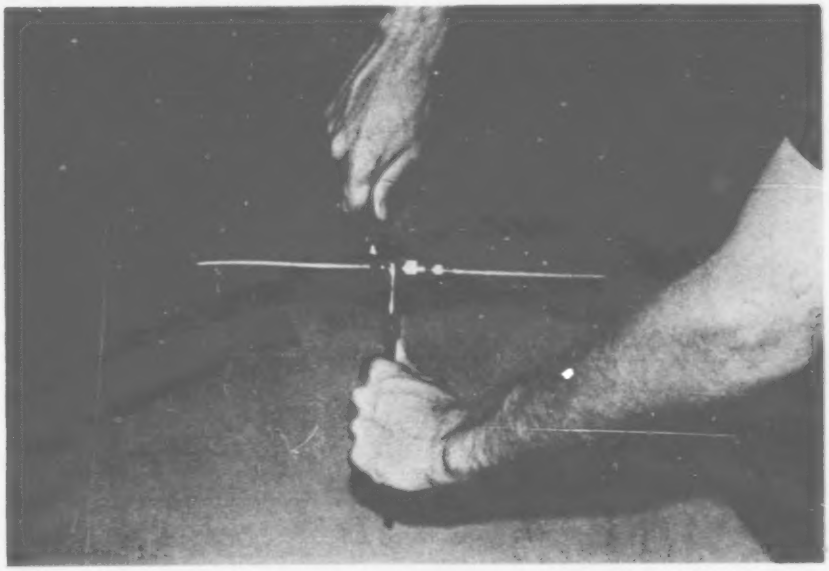

Figure 9.

Task 12

Given a 6" and a 10" adjustable wrench, two lengths of flared copper tubing and a quantity of brass fittings, the student will assemble the tubing and fittings as demonstrated by the evaluator. **Note time!**

Preliminary Exercise:

The evaluator will identify a ½" x 12" section of PVC pipe and demonstrate how to clean the pipe, apply cement, and join the pipe to a ½" PVC coupling. (See Figure 10.)

Figure 10.

Task 13

Given a ½" x 12" section of PVC pipe, a can of PVC cleaner, PVC cement, and a ½" coupling, the student will clean the pipe, apply the cement, and join the pipe and coupling as demonstrated by the evaluator. **Note time!**

VOCATIONAL EDUCATION READINESS TEST (VERT)
SCORING RESULTS SHEET

NAME: _____

PLUMBING TEST

Measurement Skills (for tasks 1 - 4, check (✓) the appropriate column)

	Response*		Handicapped Response**		Regular Response **	
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Task 1 (Inch)	_____	_____	8	7	14	1
Task 2 (Half-Inch)	_____	_____	7	8	14	1
Task 3 (Quarter-Inch)	_____	_____	1	14	12	3
Task 4 (Eighth-Inch)	_____	_____	3	12	12	3

Student Performance Data (beginning with task 5, record the completion time in seconds)

	TIME*	MEAN HANDICAPPED TIME**	MEAN REGULAR TIME**
Task 5	_____	64	53
Task 6	_____	74	66
Task 7	_____	436	101
Task 8	_____	649	339
Task 9	_____	4321	2396
Task 10	_____	586	330
Task 11	_____	550	320
Task 12	_____	441	219
Task 13	_____	146	106

* Write N/C should the student be unable to complete the task.

** These comparative scores were taken from statistical tables in this **User's Manual.**

COMMENTS: _____

_____

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Rx: _____

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Appendix A

PROJECT STEERING COMMITTEE

Robert T. Richards, Counselor/Evaluator for Goodwill Industries, Jackson, Mississippi

Russell B. Walton, Supervisor of the Deaf and Hard of Hearing and Special Education, Jackson, Mississippi

Walter Moore, Special Education Division of the State Department of Education, Jackson, Mississippi

W. T. Taylor, Supervisor of Disadvantaged and Handicapped Students for the Vocational-Technical Division, Jackson, Mississippi

Judy McLarty, Assistant Supervisor for Disadvantaged and Handicapped, Jackson, Mississippi

Shirley Darby, Prevocational Orientation Teacher, Batesville, Mississippi

Jesse Franklin, Prevocational Orientation Teacher, Columbia, Mississippi

Wanda Lambuth, Vocational Counselor, McComb, Mississippi

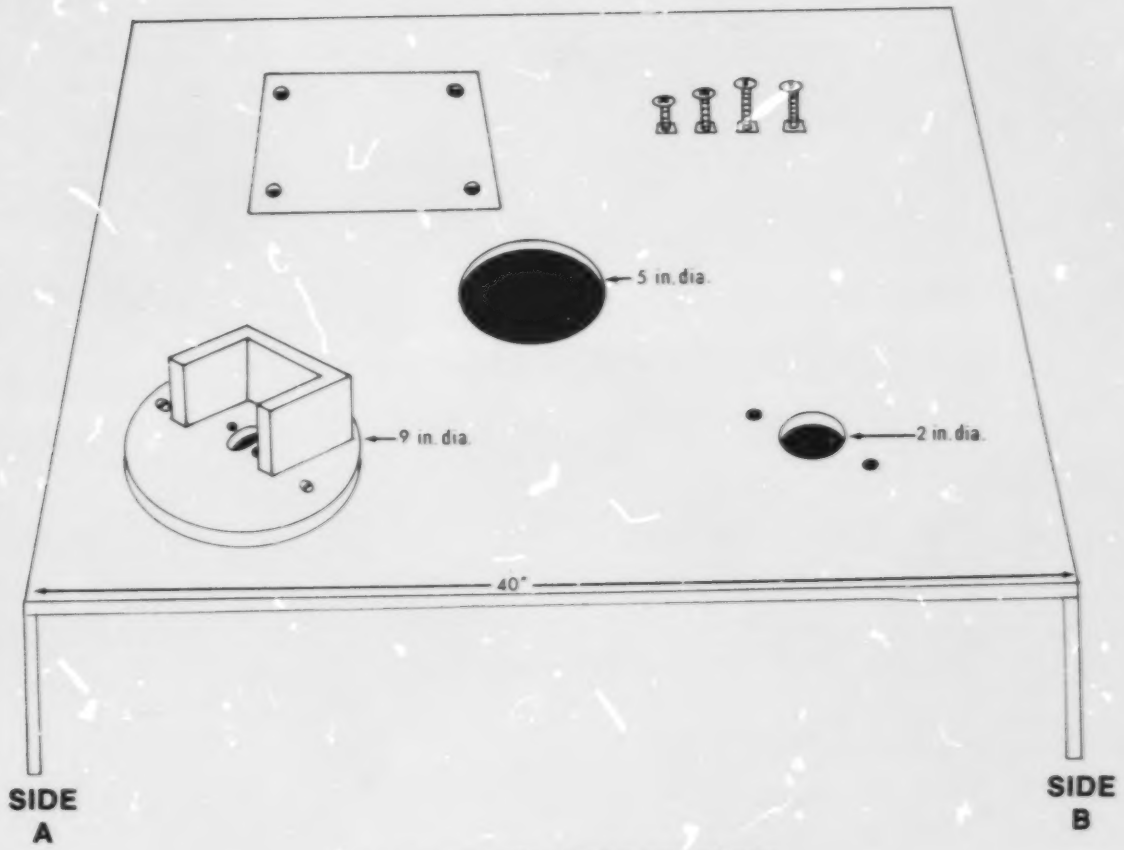
James F. Shill, Director of the Research and Curriculum Unit, Mississippi State University

Edward L. Thomas, R. and D. Coordinator, Mississippi State University

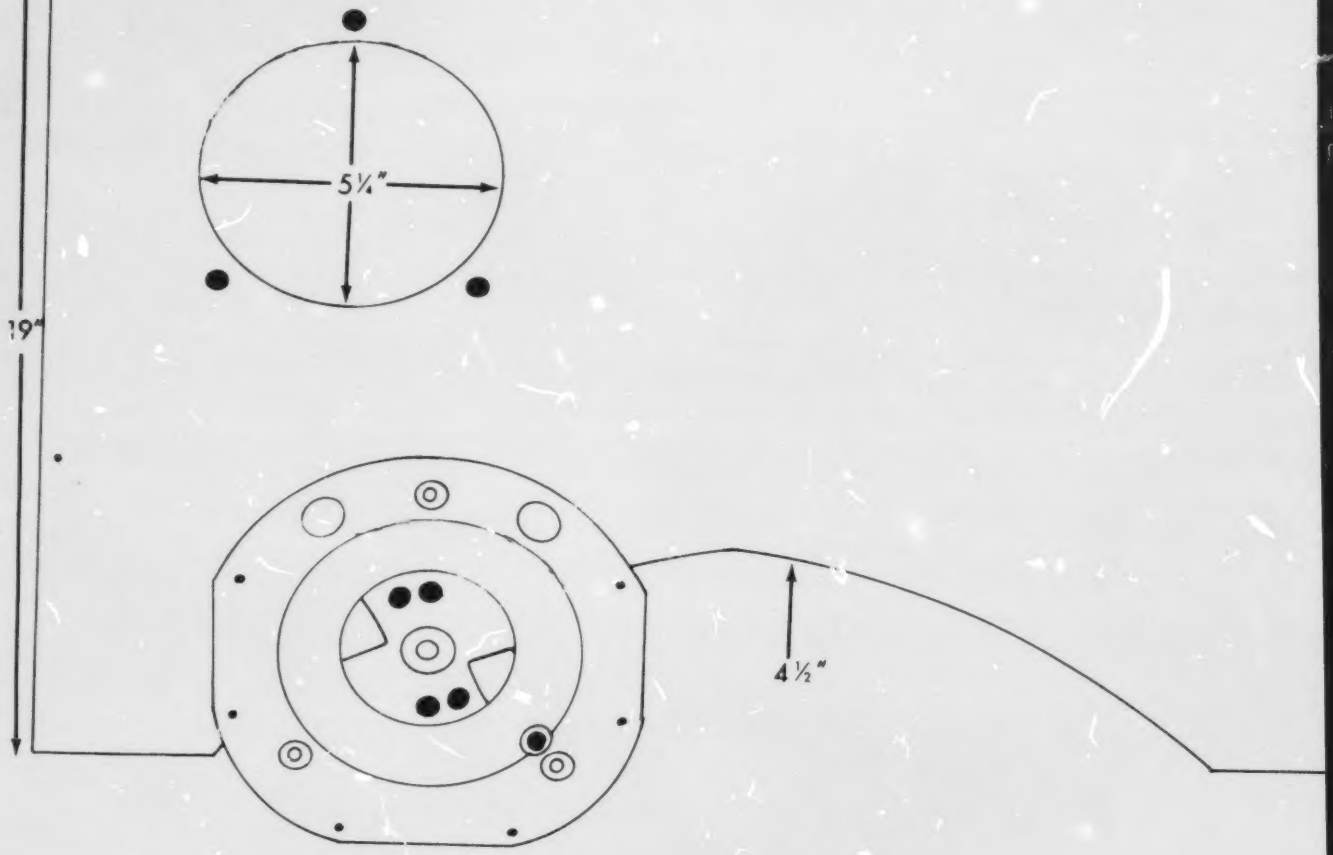
Louie E. Kemp, Field Services Coordinator, Mississippi State University

Charlene Callaway, Data Analyst for the Research and Curriculum Unit, Mississippi State University

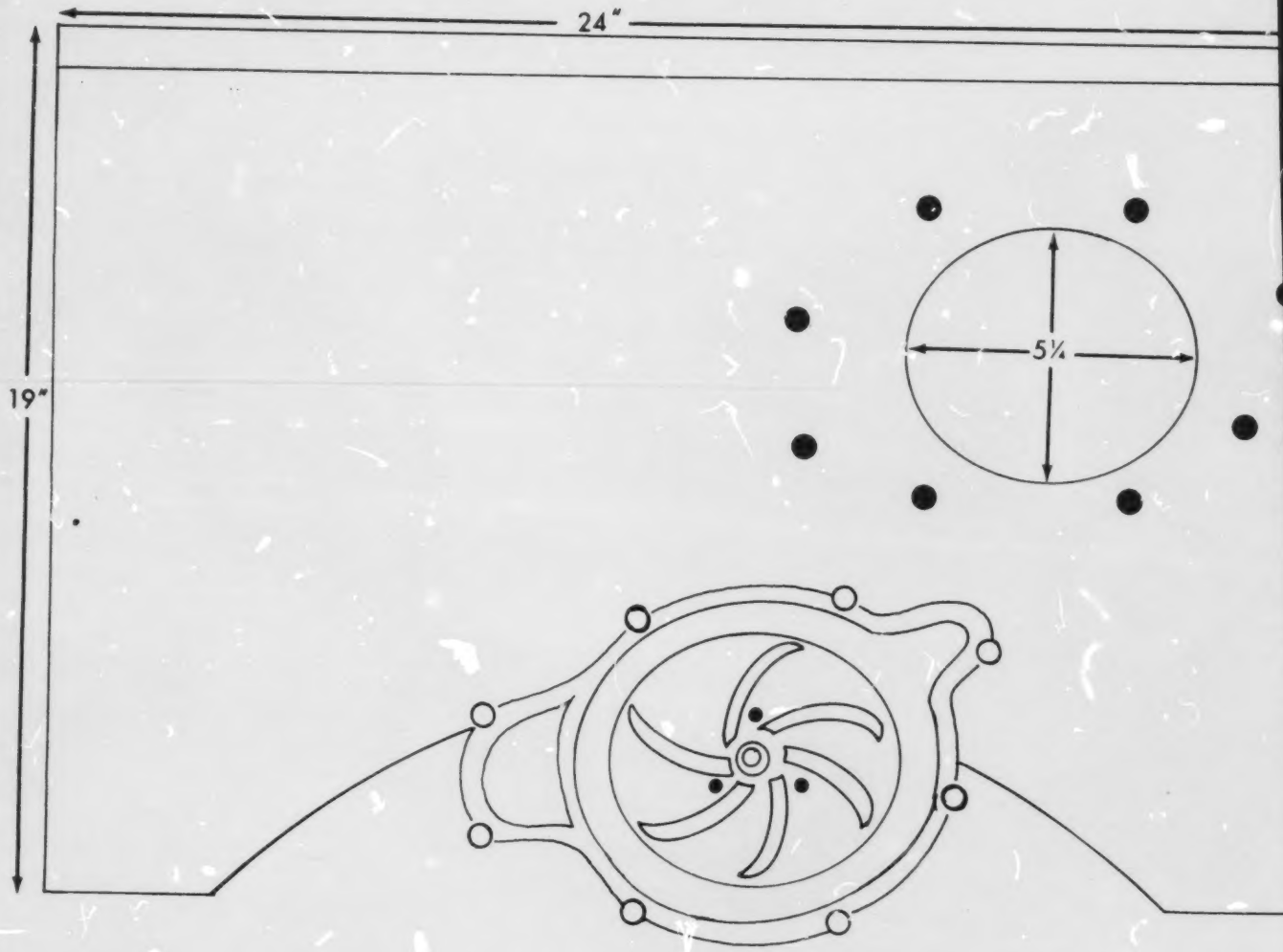
APPENDIX B



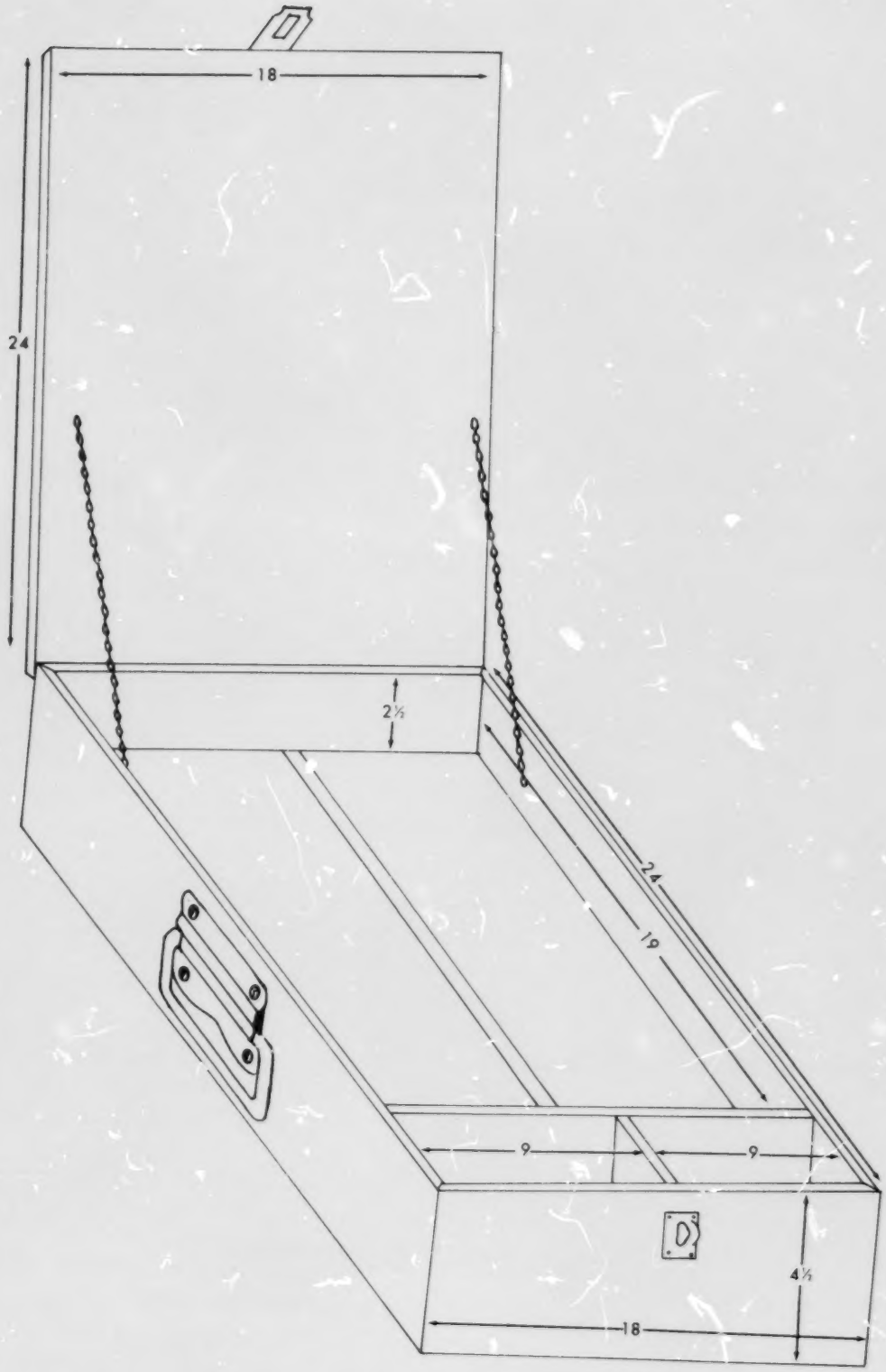
AUTO-MECHANICS MOCKUP
(Top View)



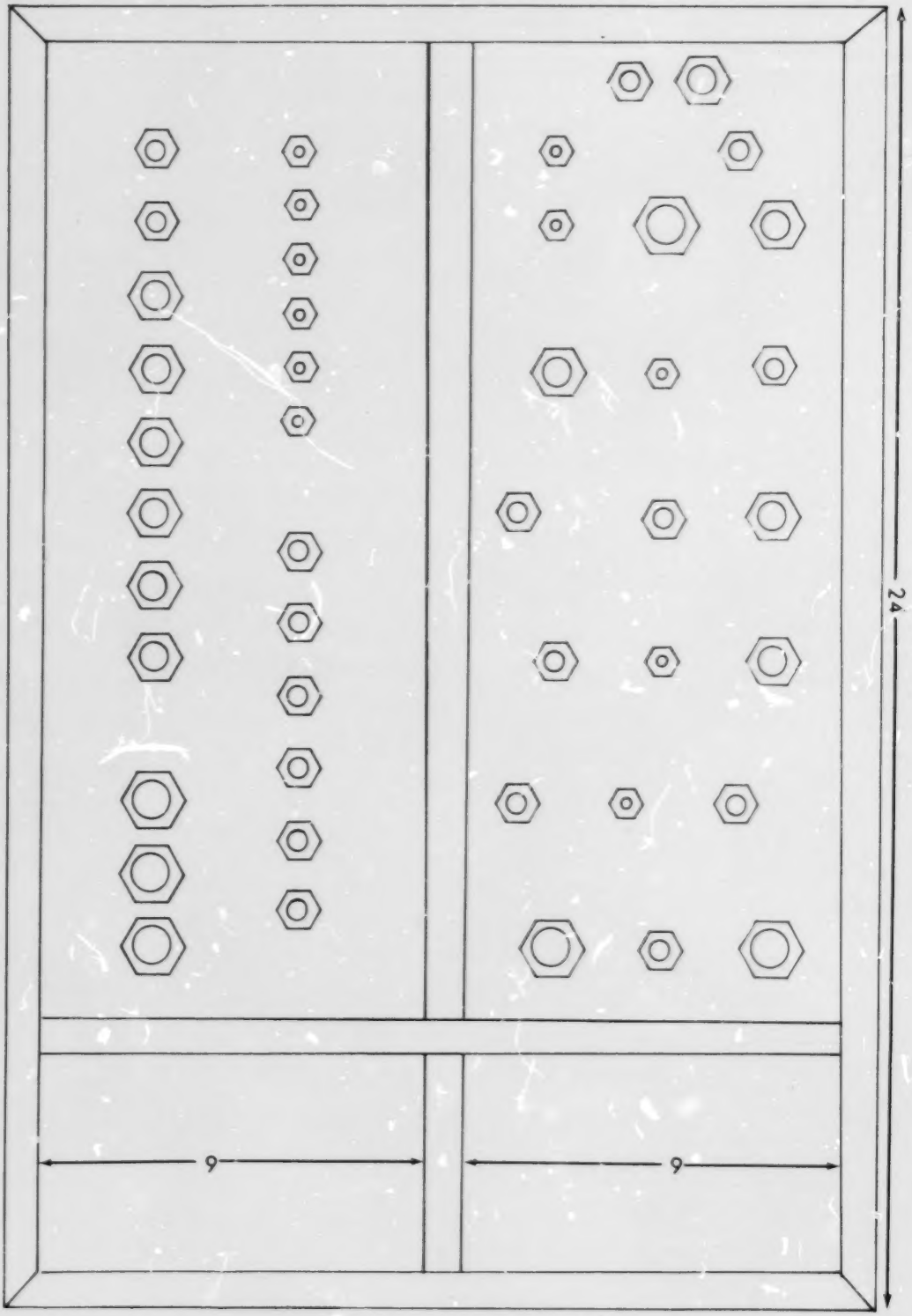
SIDE A VIEW OF AUTO-MECHANICS MOCKUP



SIDE B VIEW OF AUTO-MECHANICS MOCKUP



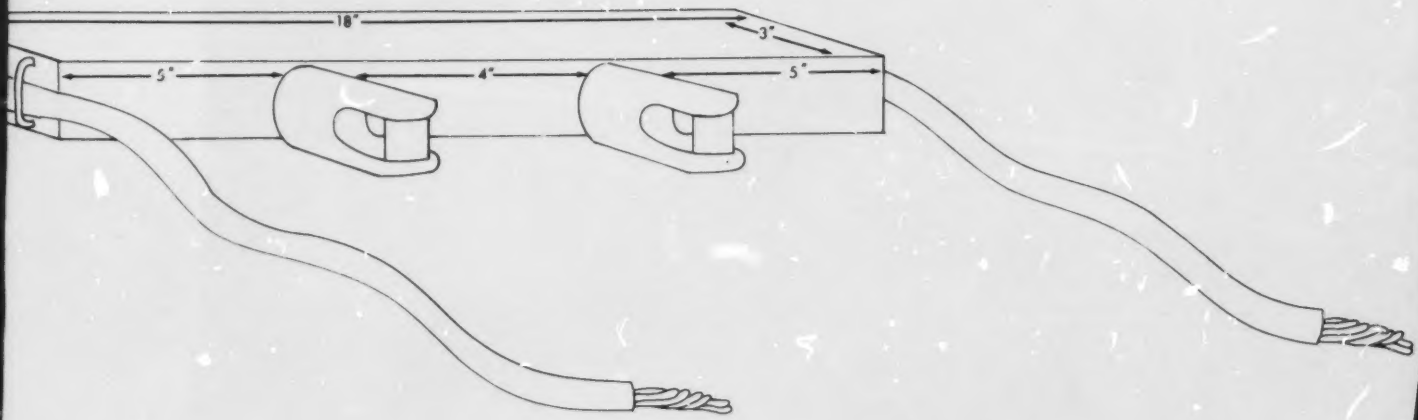
FINGER DI



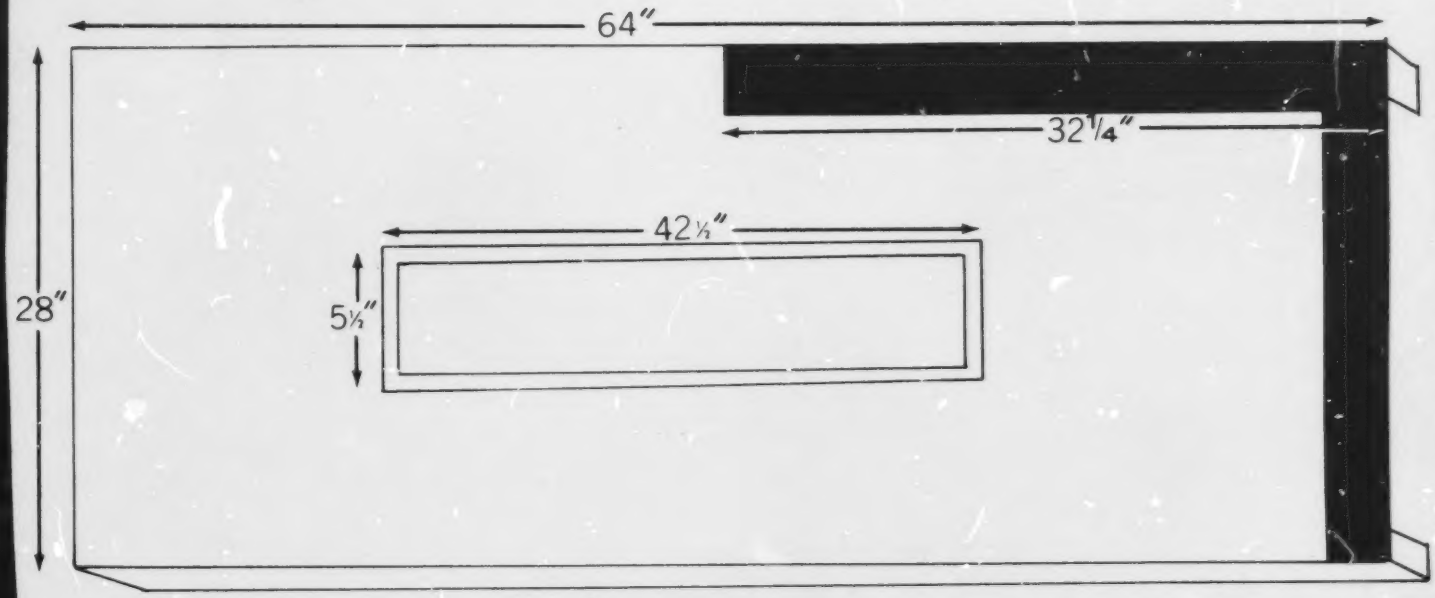
XTERITY KIT

17

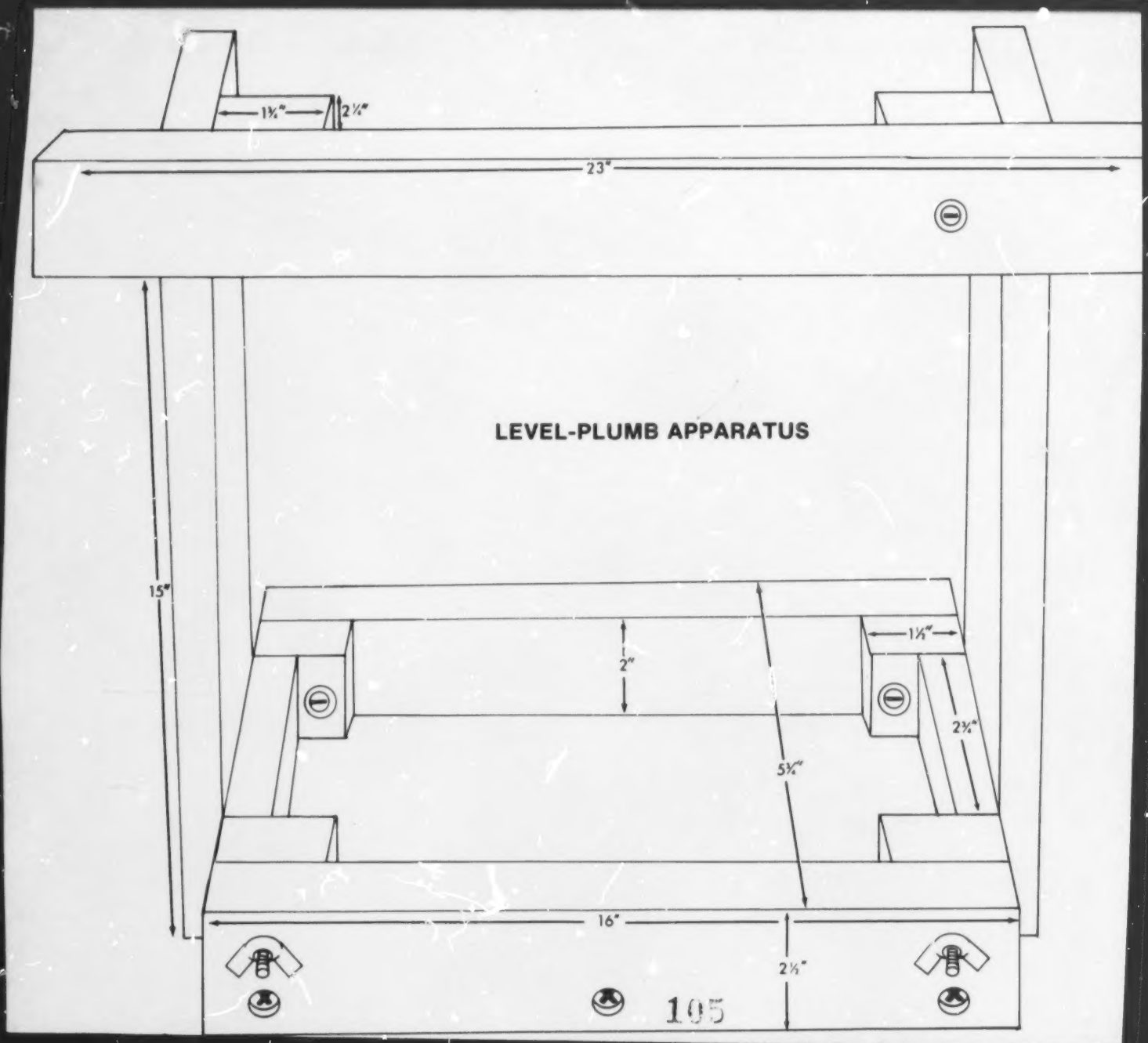
ELECTRICAL WIRING MOCKUP



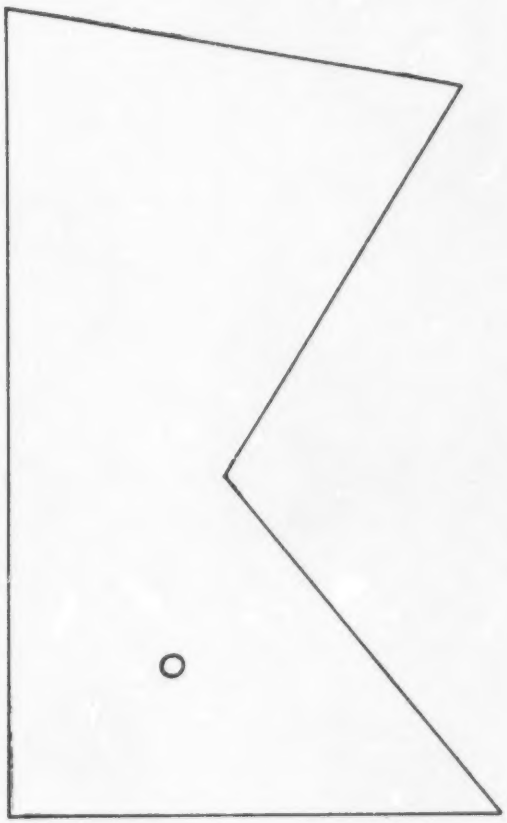
ENTRANCE CABLE ATTACHMENT



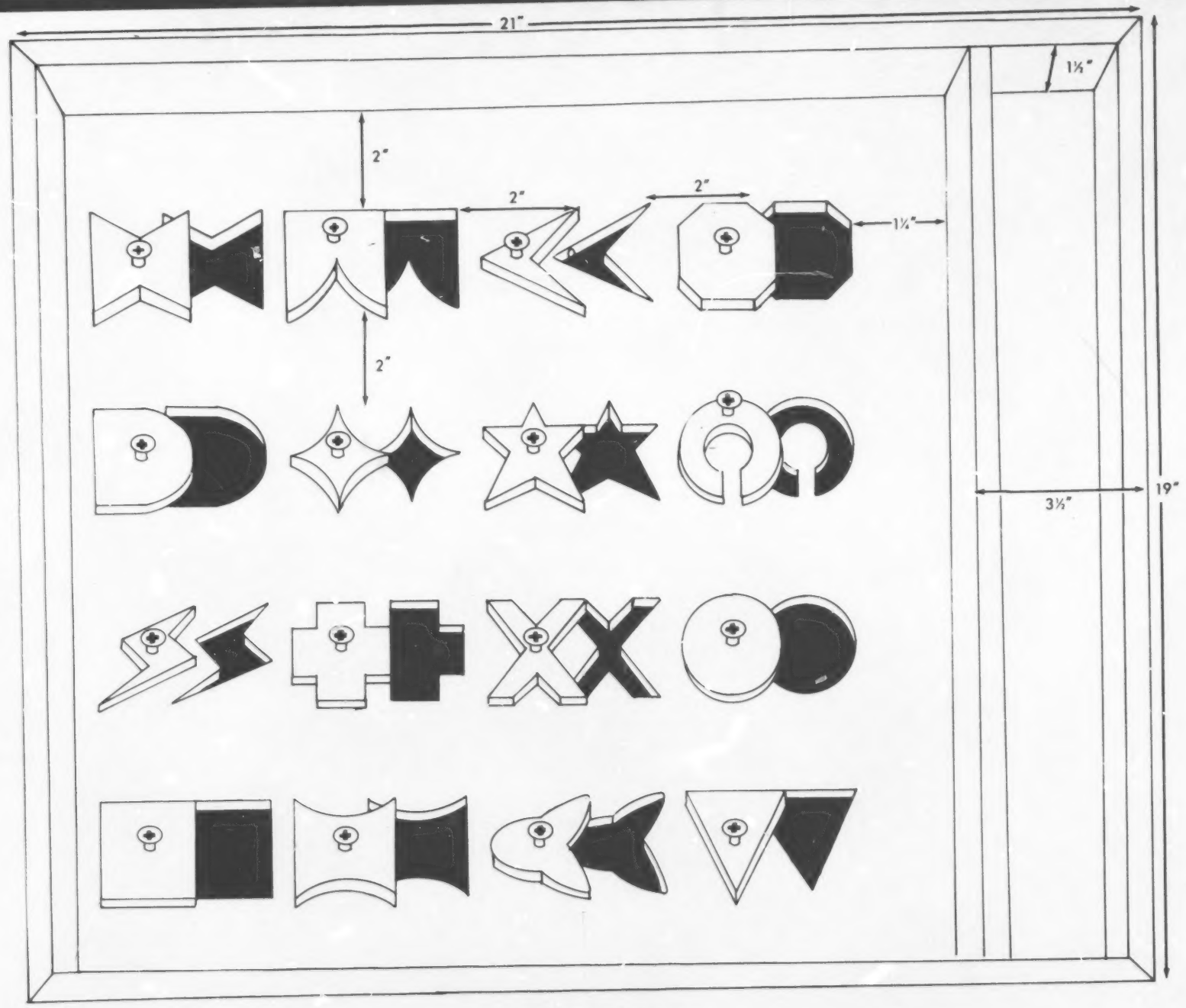
MASONRY PLATFORM
(Base construction of 2 x 4 frame)



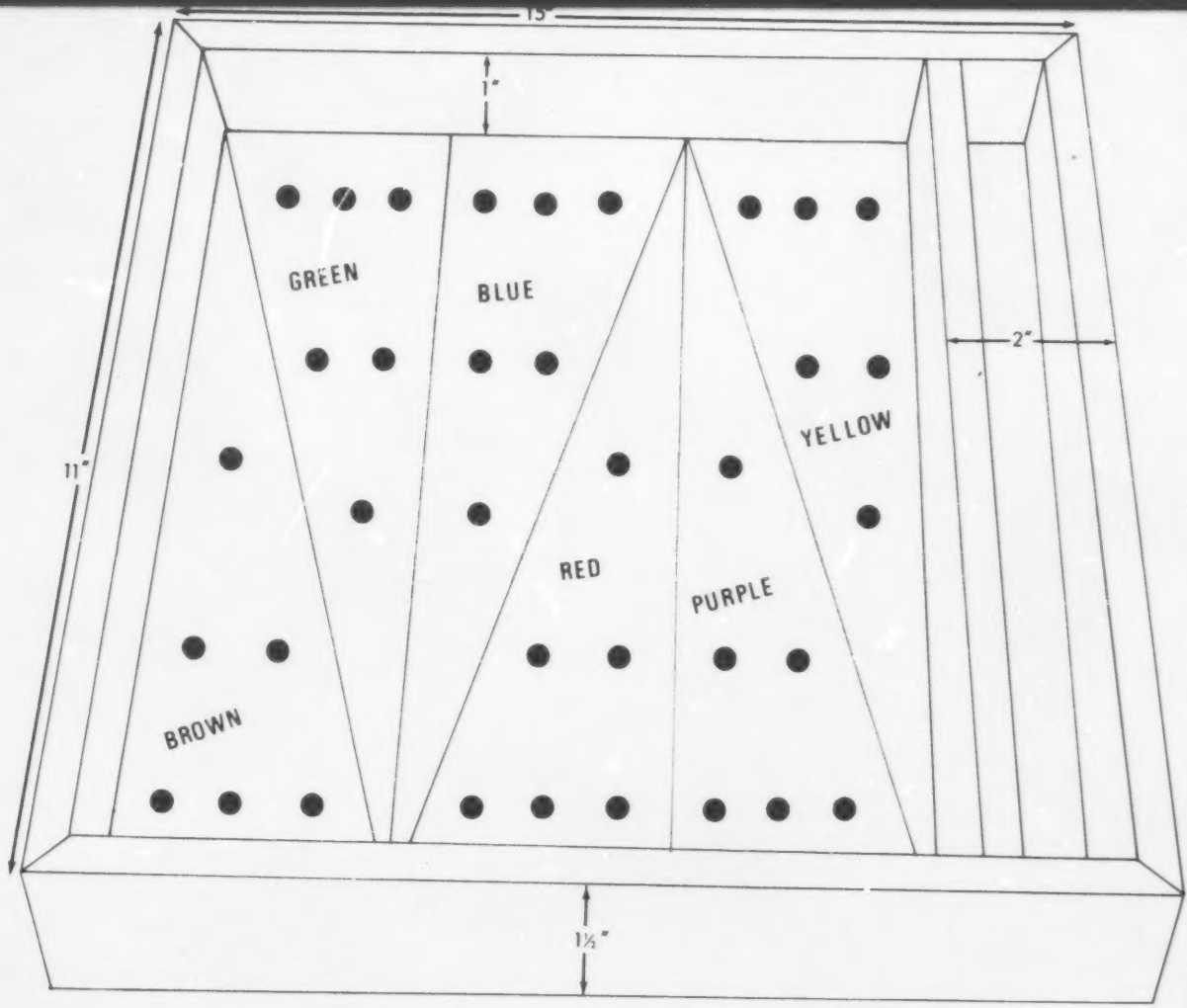
LEVEL-PLUMB APPARATUS



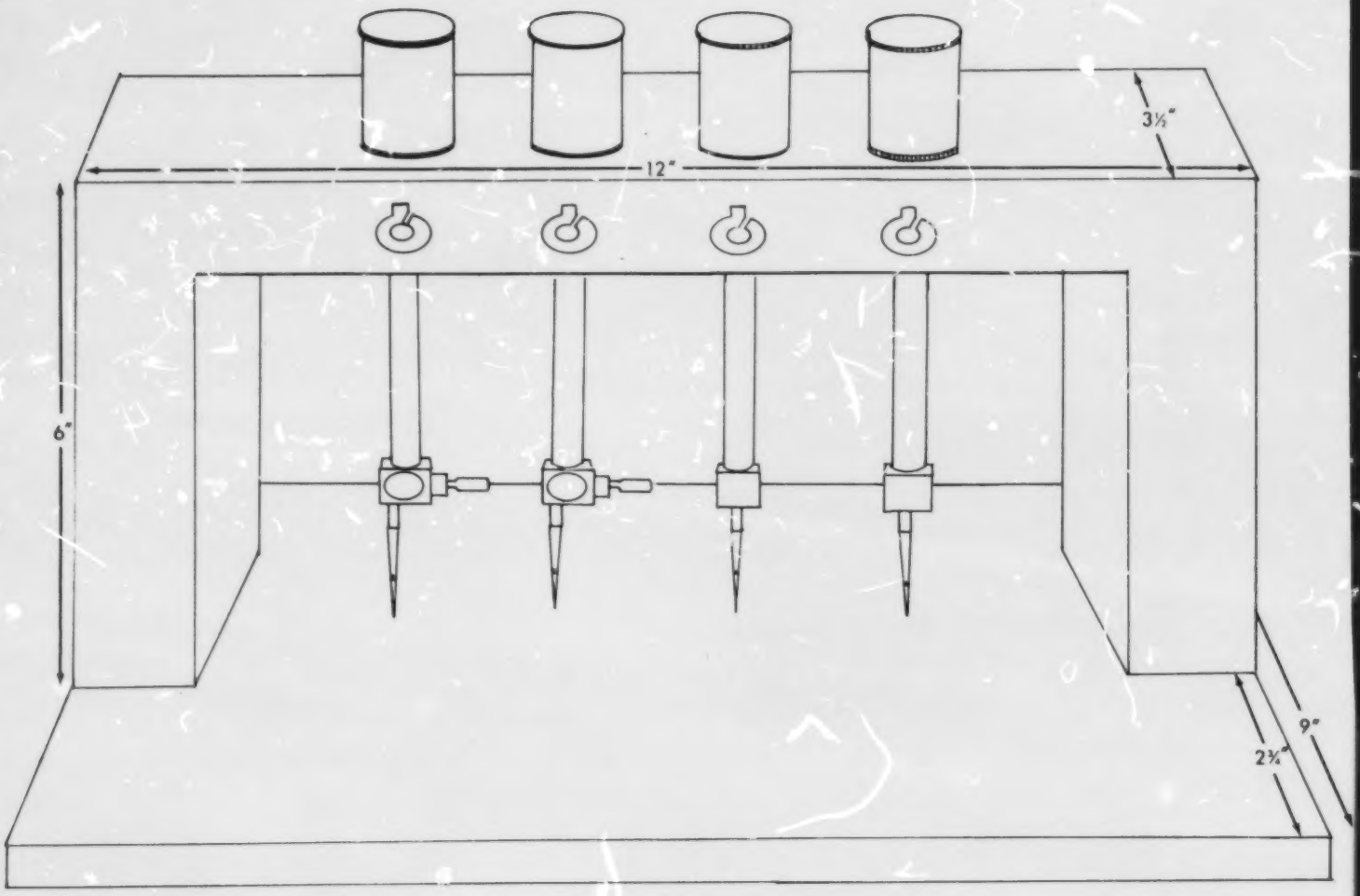
POLYGEN



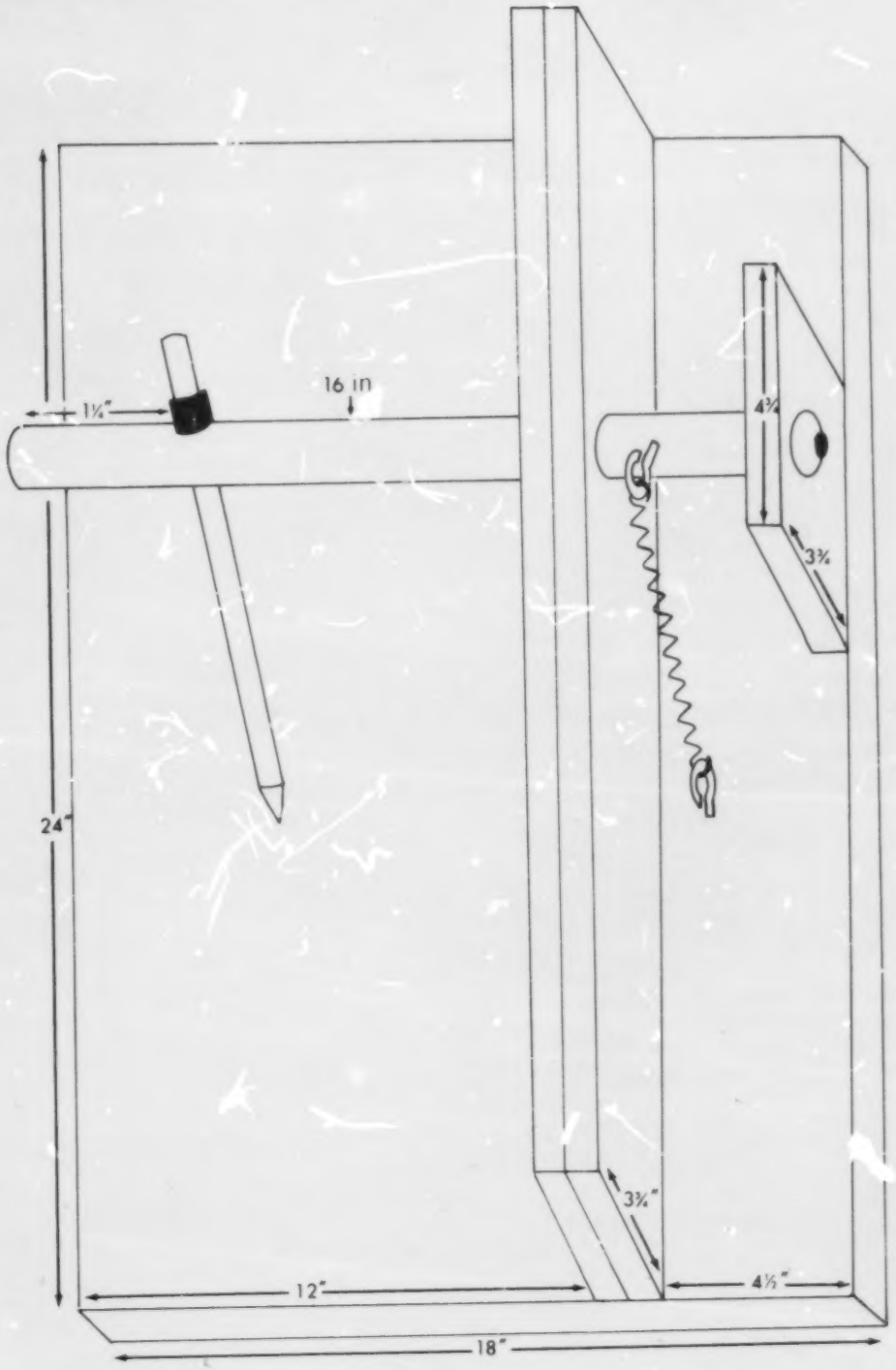
FORM BOARD



COLOR BOARD



NEEDLE-THREADING APPARATUS



SEWING MACHINE MOCKUP

110

APPENDIX C

TABLE I

MEASUREMENT SKILLS - AUTO MECHANICS

REGULAR STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
15	100	0	0	15	100	0	0	14	93	1	7	11	74	4	26

C* - Correct
I* - Incorrect

TABLE 2

MEASUREMENT SKILLS - AUTO MECHANICS

HANDICAPPED STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
8	53	7	47	6	40	9	60	4	27	11	73	5	33	10	67

C* - Correct
I* - Incorrect

TABLE 3

TASK COMPLETION (SECONDS) - AUTO MECHANICS

REGULAR AND HANDICAPPED STUDENTS

REGULAR STUDENTS N = 15
HANDICAPPED STUDENTS N = 15

Task	Regular Mean	SD	Handicapped Mean	SD
5	200	43	245	67
6	156	33	173	43
7	18	4	31	16
8	1063	476	1446	510
9	391	149	397	223
10	381	129	387	211
11	331	113	381	270
12	148	40	179	64
13	281	60	320	355
14	206	41	234	72

TABLE 4

MEASUREMENT SKILLS - BASIC WIRING

REGULAR STUDENTS

N = 25

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
24	96	1	4	24	96	1	4	24	96	1	4	23	92	2	8

*C - Correct
*I - Incorrect

TABLE 5

MEASUREMENT SKILLS - BASIC WIRING

HANDICAPPED STUDENTS

N = 25

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
15	60	10	40	5	20	20	80	2	8	23	92	2	8	23	92

*C - Correct
*I - Incorrect

TABLE 6

TASK COMPLETION (SECONDS) - BASIC WIRING

REGULAR AND HANDICAPPED STUDENTS

REGULAR STUDENTS N = 25
HANDICAPPED STUDENTS N = 25

Task	Regular Mean	SD	Handicapped Mean	SD
5	11	6	57	197
6	184	397	220	363
7	36	14	90	194
8	142	196	182	253
9	96	35	120	54
10	180	252	194	250
11	67	27	141	260
12	287	110	378	215
13	205	94	314	232
14	162	83	219	176

TABLE 7

MEASUREMENT SKILLS - CARPENTRY

REGULAR STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
15	100	0	0	15	100	0	0	15	100	0	0	15	100	0	0

*C - Correct
*I - Incorrect

TABLE 8

MEASUREMENT SKILLS - CARPENTRY

HANDICAPPED STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
15	100	0	0	15	100	0	0	15	100	0	0	14	93	1	7

*C - Correct
*I - Incorrect

TABLE 9

TASK COMPLETION (SECONDS) - CARPENTRY

REGULAR AND HANDICAPPED STUDENTS

REGULAR STUDENTS N = 15
HANDICAPPED STUDENTS N = 15

Task	Regular Mean	SD	Handicapped Mean	SD
5	18	7	28	18
6	44	10	50	15
7	60	31	83	39
8	92	44	125	69
9	96	63	116	35
10	125	48	168	60
11	180	68	244	80
12	97	37	171	70
13	77	26	127	91
14	186	87	272	111
15	225	57	221	60
16	59	36	62	24
17	21	11	26	17
18	49	18	66	21
19	199	102	260	83

TABLE 10
MEASUREMENT SKILLS - CLOTHING
REGULAR STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
15	100	0	0	15	100	0	0	15	100	0	0	15	100	0	0

*C - Correct
*I - Incorrect

TABLE 11
MEASUREMENT SKILLS - CLOTHING
HANDICAPPED STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
15	100	0	0	4	26	11	74	2	13	13	87	3	20	12	80

*C - Correct
*I - Incorrect

TABLE 12

TASK COMPLETION (SECONDS) - CLOTHING

REGULAR AND HANDICAPPED STUDENTS

REGULAR STUDENTS N = 27
HANDICAPPED STUDENTS N = 23

Task	Regular Mean	SD	Handicapped Mean	SD
5	55	7	90	42
6	51	10	93	26
7	132	30	255	97
8	101	47	172	106
9	185	55	256	57

TABLE 13
MEASUREMENT SKILLS - MASONRY
REGULAR STUDENTS

N = 18

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
18	100	0	0	18	100	0	0	17	94	1	6	12	67	6	33

*C - Correct
*I - Incorrect

TABLE 14
MEASUREMENT SKILLS - MASONRY
HANDICAPPED STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
15	100	0	100	3	20	12	80	0	0	15	100	0	0	15	100

*C - Correct
*I - Incorrect

TABLE 15

TASK COMPLETION (SECONDS) - MASONRY

REGULAR AND HANDICAPPED STUDENTS

REGULAR STUDENTS N = 18
HANDICAPPED STUDENTS N = 15

Task	Regular		Handicapped	
	Mean	SD	Mean	SD
5	95	11	118	20
6	46	9	56	14
7	105	21	139	45
8	172	33	296	227
9	209	48	323	227
10	118	25	121	45
11	129	30	202	252

TABLE 16

MEASUREMENT SKILLS - PLUMBING

REGULAR STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
14	93	1	7	14	93	1	7	12	80	3	20	12	80	3	20

C* - Correct
I* - Incorrect

TABLE 17

MEASUREMENT SKILLS - PLUMBING

HANDICAPPED STUDENTS

N = 15

Task 1 (INCH)				Task 2 (HALF-INCH)				Task 3 (QUARTER-INCH)				Task 4 (EIGHTH-INCH)			
C*	%	I*	%	C	%	I	%	C	%	I	%	C	%	I	%
8	53	7	47	7	47	8	53	1	7	14	93	3	20	12	80

C* - Correct
I* - Incorrect

TABLE 18

TASK COMPLETION (SECONDS) - PLUMBING

REGULAR AND HANDICAPPED STUDENTS

REGULAR STUDENTS N = 15
HANDICAPPED STUDENTS N = 15

Task	Regular Mean	Regular SD	Handicapped Mean	Handicapped SD
5	53	25	64	18
6	66	18	74	18
7	101	53	436	379
8	339	291	649	352
9	2396	3942	4321	4804
10	330	309	586	375
11	320	299	550	264
12	219	255	441	366
13	106	27	146	49